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The Harveian Oration
ON
THE DEBT OF SCIENCE TO MEDICINE.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON ON ST. LUKE'S DAY, OCTOBER 18TH,

BY

ARCHIBALD E. GARROD, K.C.M.G., D.M., LL.D., F.R.C.P., F.R.S.,

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MR. PRESIDENT AND FELLOWS OF THE COLLEGE,—More than two centuries and a half have passed since the most illustrious of our Fellows founded the Festival which we celebrate to-day, and directed that an oration should be delivered by one of our number. Upon the long list of Harveian Orators are many names familiar wherever medicine is studied, and amongst them those of my six most recent predecessors in my chair. I esteem it a great honour that you, Sir, should have thought me worthy to stand here to-day, and to deliver Harvey's message.

It will be my endeavour to follow the injunctions which he laid down: to commemorate the great men of the past, benefactors not only to this College but to the human race; to exhort our brethren to work together in peace and amity, and to urge them to pursue the study of our science, by methods of which he himself made such good use.

Ever since this College was founded its Fellows and Members have, generation by generation, brought their several stones to the building of the house of medicine. Upon its Roll are names of "men in their generation famous, and in ours never to be forgotten," men of genius whose fame as discoverers and as pioneers, in medicine and in other branches of natural science, is world-wide and will never die; and of some highly distinguished in other walks of life, great scholars, such as Linacre and Caius, poets and philosophers. Upon it, too, are names of generous benefactors to scientific education, such as John Radcliffe and Matthew Lee, and of commanding personalities, patrons of science, art, or letters, such as Richard Mead, the Mecænas of his day.

But these great ones form only a small minority, and most of those upon our lists were men of lesser stature; but as teachers who handed down to their pupils the treasures of their observation and experience, busy practitioners, keen observers, or men of varied culture, few of them can have failed to add something to the sum of human knowledge. Yet many of their names recall no memory, or have attained to that most arid form of immortality, to serve as labels for malady or symptom. But, collectively, the work which they did counts for much, and those of us who are conscious that we shall leave no "footprints on the sands of time" may take courage from the thought that we too are helping to do the spade work for some future Harvey.

On this occasion it is only fitting that special mention should be made of one born just three hundred years ago, and who, although, owing to a technical obstacle now long obsolete, he was not a Fellow of this College, held its licence; and we may associate in our celebration the names of William Harvey, the physician to King Charles and the immortal founder of modern physiology, and Thomas Sydenham, the soldier of the Parliament, who did for clinical medicine what Harvey did for physiology, and brought it back from the realm of fancy to the bedside study of signs and symptoms. These two men, Harvey and Sydenham, each pre-eminent in his own line, were wholly unlike in their outlook, and although contemporaries are not known ever to have met.

Sydenham, at the mention of whose name the illustrious Boerhaave used to raise his hat, has been called the English Hippocrates, and by this College, on his monument, "Medicus in omne ævum nobilis." Certainly no man ever had, in greater degree, the gift of conveying, in a few sentences, a vivid picture of a morbid state, and even though we may rejoice that those dear to us are no longer treated in accord with his prescription, we realize that he opened a new era of therapeutics. To him must be assigned a high place among our benefactors.

The history of medicine traces back to the birth of our race, and even beyond, for we know that the lower animals have therapeutic instincts. From the outset treatment has been shaped by prevalent notions of the nature of disease, and maladies provoked by the enmity of a primitive deity, or by the malicious magic of a fellow creature, are only likely to be cured by magical methods. In Osler's words: "To a very definite but entirely erroneous pathology, was added a treatment rational in every respect, had the pathology been correct." The primitive medicine and the art of the medicine-man survive to this day among the savage races of the earth, and he would be a bold man who should deny their survival amongst those races which regard themselves as the highest products of civilization. Are any of us wholly free from such ideas?

For ages medicine has striven to shake off her bonds, and to attain to the status of a science. The first act of the drama was staged in ancient Greece. We know well that the true spirit of inquiry, the desire for knowledge for its own sake, was innate in that wonderful race, of which the intellectual life centred around the city in which the people "spent their time in nothing else, but either to tell or to hear some new thing." The legacy of Greece embodies not only the Parthenon and the Erechtheum, the sculptures of Pheidias and Praxiteles, the plays of Æschylus and Euripides, the thoughts of Socrates and the works of Plato. Greece gave us also Aristotle and Hippocrates. Only the true spirit of science could have prompted the minute and accurate research into the structure and functions of living things which are embodied in the writings of Aristotle, or the pictures of disease and its symptoms to be found in the clinical records of Hippocrates. Do we not still speak of the "facies Hippocratica" and of Hippocratic succussion?

We cannot doubt that there were forerunners of Aristotle, nor that much of the knowledge embodied in his books had been collected by lesser men. Nor can we doubt that there were scientific physicians before Hippocrates, men of the schools of Cnidus and Cos, some of whose writings are included in the Hippocratic corpus. Indeed, Aristotle, whose lifetime overlapped that of Hippocrates, bears witness to this when he speaks of physicians as men who usually base their medical theories upon principles derived from physics. We must rather suppose that, like other men of genius, Hippocrates illuminated and crystallized the floating knowledge in the atmosphere of the Asklepieion. But Hippocrates was something more than a man of science, for when we read what he has written we realize that the most cherished traditions of our profession, the rules of its conduct, were inherent in the Father of Medicine, the author of the Hippocratic oath.

When, at a later period, the centre of Greek medicine shifted to Alexandria, Erasistratus and Herophilus had opportunities for the practical study of human anatomy such as none had before them; and in the second century of our era, the Greek tradition culminated in the life and writings of Claudius Galen, a great physician, a true inquirer of Nature, author of many treatises, imbued with the spirit of Hippocrates, but not so great as he. It was the strange fate of this man to be set up as an oracle, to be regarded for more than a thousand years as infallible and his statements as admitting of no appeal. Then after Galen the curtain falls, to be rung up again only in the sixteenth century of our era.

During that long inter-act the races which had overthrown and overrun the empire of Rome were being educated *de novo*, to appreciate the culture which they had destroyed. Meanwhile, the keeping of the works of the ancient physicians passed to the Arab races, and for centuries were only known in Syriac or Arabian translations, or in retranslations from those tongues into Latin. Then in the end science stirred in her sleep in the thirteenth, and finally reawakened in the sixteenth century. There was indeed much leeway to be made up. Even as late as in the year 1559 Dr. John Geynes was cited before

this College because he impugned the infallibility of Galen and was obliged to sign a solemn recantation of his error: "Ego Johannes Geynes fateor Galenum, in iis quæ proposui contra eum, non errasse." Surely, in the Elysian fields, the shade of Galen chuckled!

Great as were the achievements of the fathers of medicine, they began to construct their edifice with the attics. Their anatomy was almost wholly that of the lower animals, and the physiology of Galen seems to us grotesque. The sciences upon which anatomy and physiology rest were hardly yet born. If medicine were to be established upon a scientific basis the structure needed to be firm from the ground upwards, and from the sixteenth century onwards the foundation sciences, and those which form the lower stories, have been cultivated and advanced largely by medical men who saw them to be essential to the progress of their own science and art.

So medicine, oldest of applied sciences, older indeed than the sciences applied, has through the ages furthered the growth of natural knowledge. How profound her influence has been, and how it has been exerted, it is my present aim to show.

Research and education are closely linked, but whereas from their earliest days there have existed, in the universities of Europe, the three professional faculties of Divinity, Law, and Medicine, that of Natural Science is of quite recent development. For the student with a scientific bent two paths were open: he might either attach himself to the Faculty of Medicine, or might approach his chosen studies by way of mathematics.

Even down to the seventeenth century, or later, the university course in medicine was almost wholly theoretical. The Professor expounded to his pupils the writings of Hippocrates and Galen, together with those of some of the great Arabians, such as Avicenna and Rhazes. Such were the duties assigned by Linacre to his lecturers at Oxford and Cambridge, and those of the Regius Professors at those ancient seats of learning. Thomas Molyneux (1661-1733), a young graduate of Dublin, where he was afterwards Professor of Medicine, visited Oxford in 1683, and heard the Regius Professor, Dr. Luff, "read on the first aphorism of Hippocrates in the Physic School; where giving an account of the shortness of man's life since, and the length of it before the flood, he made up of Mr. Burnett's fancy, not at all altered but in the word." No wonder that Molyneux was not diverted from his purpose to continue his studies at Leyden, where clinical medicine was being taught in a university clinic. Elsewhere clinical knowledge was acquired by attendance upon the practice of a physician or surgeon, a system of apprenticeship which has this to its credit—that out of it has grown the English system of bedside instruction to small groups of students. The first attempt to start clinical teaching within the university was made in Padua in the late sixteenth century, but the first organized clinic was that in Leyden, started in about the year 1630.

The study of science for its own sake, apart from any professional applications, began again in the sixteenth century, and was active in the century which followed. In this country Oxford took a large part in the renascence of pure science. There Robert Boyle, the "father of chemistry," set up his private laboratory in 1654; and around John Wilkins, Warden of Wadham—the college of Mayow and Sydenham, and one to which science and medicine owe much—there gathered a group of men eager for the advancement of natural knowledge, who, with the members of the "Invisible College" in London, formed the nucleus of the future Royal Society. In the same century chairs of astronomy, natural philosophy, anatomy and botany were founded in Oxford, and the Botanic Garden was established. In 1657 Thomas Millington (1628-1704), a President of this College, was made Sedleian Professor of Natural Philosophy; and the first Savilian Professor of Geometry and Astronomy, John Bainbridge (1582-1643), was also one of our Fellows.

How large a part members of our profession played in this reawakening of science is shown by the large proportion of medical men among the original Fellows of the Royal Society. Of the total of 115, which included peers, clerics, and distinguished people such as John Evelyn and Samuel Pepys, only a small proportion were men of science in any strict sense, and of these no less than 25 were Doctors of Medicine, whilst 21 were Fellows of this College.

In the reawakening of medical science Italy took the lead, and especially in the study of anatomy. Of her universities, Padua, under the enlightened rule of the Venetian Republic, became the chief centre of medical teaching in Europe, and thither repaired the pick of our English students to profit by teaching such as they could not obtain at home. Later, when the star of Padua paled for a time, Leyden took its place as the cynosure of students of medicine.

Of the professions open to him in former centuries that of medicine would obviously make most appeal to the youth of scientific bent, and as L. C. Miall puts it in his book on "The Early Naturalists":

> "The medical school furnished the only regular training for the naturalist, whilst he found in the medical profession the likeliest means of earning his bread."

In his Rectorial Address to the University of Aberdeen, delivered in 1874, Huxley brought out the same point, with even wider application, when he said:

> "Within my recollection, the only way in which a student could obtain anything like a training in physical science was by attending the lectures of professors of physical and natural science attached to the medical schools."

Still more striking is the following passage from the same address:

> "In the days when all the innumerable applications of physical science to practical purposes were non-existent even in dreams; days which men living have heard their fathers speak of, what little physical science could be seen to bear directly upon human life lay within the province of medicine. Medicine was the foster-mother of chemistry, because it had to do with the preparation of drugs and the detection of poisons; of botany because it enabled the physician to recognize medicinal herbs; of comparative anatomy and physiology, because the man who studied human anatomy and physiology for purely practical purposes was led to extend his studies to the rest of the animal world."

Now that the practical applications of science are so far greater even than when these words were spoken, and a course of scientific training is necessary or desirable as a preparation for so many walks of life, there have sprung up schools of physical science of which the Royal School of Mines and the College of Chemistry, now fused into the Imperial College of Science, were the earliest to be established in this country. Our universities also teach science in all its branches, and grant degrees therein. In a word, science has been weaned from its foster-mother.

Seeing, then, that in the past medicine has supplied opportunities of education for students of natural philosophy and natural history, and has, at the same time, supplied a stimulus to their researches, it need cause no surprise that our profession can claim, amongst its most honoured members, not a few whose work has inaugurated new epochs in widely diverse branches of natural knowledge.

At first sight it would appear that astronomy, to which the natural approach is through mathematics, is as remote from medicine as any science can be; but there was a time when the pseudo-science of astrology supplied a close tie between the study of the stars and that of disease. The mediaeval physician was profoundly influenced by the horoscope of his patient, and studied the motions and conjunctions of the planets to obtain such help in diagnosis and prognosis, as is afforded nowadays by the blood count or electro-cardiogram. He was expected to have some knowledge of astrology, and even in the sixteenth century there were amongst our Fellows such men as Thomas Twyne (1543-1613), who gained more fame as an astrologer than as a physician, and some note as a poet. True medical astronomers, on the other hand, have been few in number, but Nicolas Copernicus (1473-1543), who revolutionized man's ideas of the universe, was a physician, and amongst lesser lights mention may be made of our Fellow John Bainbridge.

Another science which has little contact with medicine is geology, save in so far as the nature of soils has bearings upon public health; but medical men have played very important parts in its advancement. Thus, Nicholas Steensen, commonly called Steno (1638-1686), who discovered the parotid duct which bears his name, may be described as one of the founders of geology and mineralogy. Most of his active life was spent in Florence, where he held the post of physician to two successive Grand Dukes. Of him von Zittel wrote, in his History of Geology, that he was the first who sought to solve geological problems by inductive reasoning. He threw much light upon the formation and structure of crystals, and, as Leonardo da Vinci had done a century and a half earlier, he maintained that fossils are the actual remains of animals and plants of former epochs. He ended his life as a Catholic bishop, and his ascetic habits undermined his health. This brilliant Dane is entitled to rank amongst the great ones of science, as anatomist, geologist, mineralogist, and physician, but his researches, so far in advance of his time, only received their due recognition after much of his work had been done over again by later investigators.

John Woodward (1665-1728), Professor of Medicine at Gresham College, and Fellow of this College, also holds a distinguished place in the annals of geology. By his observations he acquired a most extensive knowledge of the structure of the earth's crust, and had learnt much as to the superposition of the various strata, but he propounded a fantastic hypothesis that the whole globe had been taken to pieces at Noah's flood, and that from the resulting "promiscuous mass" the various strata had been deposited in quick succession. He bequeathed his collections to the University of Cambridge, where they form the nucleus of the museum which bears his name. Woodward was less eminent as a physician than as a geologist, and was evidently a quarrelsome fellow, for he forfeited his Fellowship of the Royal Society because he insulted Sir Hans Sloane, to whom he refused to apologize; and a quarrel with Mead, over the treatment of small-pox, led to a passage of arms, in which the sword of Mead but the tongue of Woodward gained the mastery. "Take your life," said Mead. "Anything but your physic," was the reply. The celebrated James Hutton also (1726-1797), who propounded the rival and sounder theory that the moulding of the crust of the earth has been effected gradually, by processes such as are now at work, was a Doctor of Medicine of Leyden, but soon abandoned the idea of medical practice.

In more recent times the presidential chair of the Geological Society has been occupied by William Babington (1756-1833), physician to Guy's Hospital, and by John Whittaker Hulke (1830-1895), surgeon to the Middlesex Hospital, to whom that Society awarded the highest prize in its gift—the Wollaston medal, founded by our former Fellow, the distinguished chemist and mineralogist of that name.

Physics and chemistry are the fundamental sciences upon which physiology and medicine rest, and throughout their history have been closely associated with medicine. Galileo Galilei (1564-1642), equally pre-eminent as astronomer and physicist, was a student of medicine when he watched the swing of the lamp in Pisa Cathedral, and so discovered the law of the pendulum. It was by his pulse that he timed the swing, and the first use which he made of his discovery was to construct an instrument to measure the frequency of its beats. The other outstanding physicist of the sixteenth century was a Fellow, and sometime President of this College, William Gilbert (1540-1603), founder of the science of magnetism, who recognized the earth's magnetic properties. Of him Dryden wrote:

> "Gilbert shall live till loadstones cease to draw,
> Or British fleets the boundless ocean awe."

This College can also claim amongst its Fellows one of the most brilliant men of science whom our country has produced, Thomas Young (1773-1829), whose discoveries in optics, and especially that of the interference of light, went far to establish the undulatory theory. He was the first to detect astigmatism, and threw much light upon the mechanism of the eye and on colour vision. He was a great linguist also, and by his work on the Rosetta stone aided materially the interpretation of the demotic text thereof. Yet he found time to hold the office of physician to St. George's Hospital, and to practise medicine.

Amongst other great medical physicists I may recall the name of Luigi Galvani (1737-1798), physician and anatomist, who was led to the discovery of current electricity by his investigations of the electric organs of certain fishes; William Charles Wells (1757-1817), who solved the problem of dew; Julius Mayer, physician of Heilbronn, to whom is due some of the credit of the determination of the mechanical equivalent of heat; and, in our own time, Hermann von Helmholtz.

There was a time, towards the end of the seventeenth century, when a dominant position in medical thought was held by a group of so-called iatro-physicists, who, influenced by the work of Galileo and his followers, and by the views on physiological problems of two great mathematicians—Descartes (1596-1650) and Borelli (1608-1679)—endeavoured, but with far less competence, to extend them to all physiological processes by the supposed action of forces upon particles of various shapes and sizes. Like the iatro-chemists, whom they superseded, they went too far, had their day, and passed. In the true line of succession from Borelli, on the other hand, was James Jurin (1684-1750), a Fellow of this College and physician to Guy's Hospital. He was an eminent mathematician and physicist, whose aim it was to make physiology an exact science.

With chemistry the links are even closer. The alchemist, who sought to prepare the elixir of life, had kindred aims to those of the physician. Later, in the period of the iatro-chemists—followers of Paracelsus, van Helmont, and Sylvius—medicine was regarded as a mere branch of chemistry, and physiology as a study of fermentations—curiously like, and yet quite unlike, the physiology of to-day. A more practical tie between chemistry and medicine was provided by the chemical side of pharmacy and the study of poisons.

It was not until the seventeenth century that chemistry began to be studied as a pure science—in the days of Robert Boyle, upon whom, as an appropriate recognition, Oxford bestowed the degree of Doctor of Medicine, and others who, like him, were actuated by a desire to know the nature and composition of things. At Oxford, the second holder of the short-lived Ashmolean Professorship of Chemistry, Edward Hannes (died 1710), was a physician; in the early years of the eighteenth century lectures on chemistry were given by John Freind (1675-1728), a Fellow of our College and Harveian Orator, and by several other medical graduates; and the first holder of the Aldrichian chair, founded in 1803, was John Kidd, afterwards Regius Professor of Medicine.

In the earlier days a knowledge of practical chemistry was only to be acquired by students in the shops of apothecaries, and as a scientific training this left much to be desired. It was Vauquelin (1763-1829) who first organized courses of instruction in his own laboratory in Paris, and this method was followed by Thenard (1777-1857) and Gay Lussac (1763-1829) and greatly extended by Liebig (1803-1873). Ernst von Meyer states that the laboratory of Thomas Thomson (1773-1852), a doctor of medicine of Edinburgh and professor of chemistry in Glasgow, was the first to provide practical teaching in Great Britain, and it was not until 1845 that the College of Chemistry was established in London, with A. W. Hofmann as its director.

The list of physician chemists is a long one, and only a few of the most eminent can be mentioned. First may be recalled John Mayow (1643-1675), one of the greatest of them all. Mayow stands high on the roll of physiologists, as well as of chemists. From the point which he reached only one step remained to the complete explanation of respiration and combustion, and but for his too early death the discovery of oxygen would almost certainly have been antedated by a century, and phlogiston would never have been heard of. Although a doctor of civil law, Mayow practised medicine at Bath. A contemporary of Mayow was our Fellow Thomas Willis (1621-1675), whose work upon the anatomy of the brain is commemorated by the circle

of arteries which bears his name. But Willis was also no mean chemist, and to him we owe the discovery of glycosuria. Mention must be made of Friedrich Hofmann of Halle (1660-1742), a contemporary of Boerhaave, and of the illustrious Herman Boerhaave (1668-1738) himself, whose treatise on chemistry was long the best textbook of the subject. Yet eminent as Boerhaave was as a chemist, it was as a physician and professor of medicine that he was pre-eminent, and it was during his tenure of its chair of physic that Leyden, as a school of medicine, reached its zenith. Cullen (1710-1790), Joseph Black (1728-1799) the discoverer of latent heat, and Wöhler (1800-1882), who, by his synthesis of urea, bridged the imaginary gap between inorganic and organic compounds, were all members of our profession who made notable contributions to chemical knowledge. It was a Professor of Medicine of Halle, Georg Ernst Stahl (1660-1734), who propounded the strange theory of phlogiston, which, like the old man of the sea, clung around the neck of chemistry and obsessed chemists for more than a century. This hypothesis, which presented an inverted picture of the truth, like a glove turned inside out, was upheld by men of the highest ability, and by none more tenaciously than by such men as Priestley and Scheele, whose own researches were knocking away the props upon which it rested. The great Swedish man of science, Berzelius (1779-1848), the foremost chemist of his time, and the inventor of our system of chemical symbols and formulae, was a doctor, and for a time a professor, of medicine; and it was by his friend Alexander Marcet, a Fellow of this College, and one whose services to biochemistry are not sufficiently remembered, that Berzelius was led to illustrate his lectures by experiments.

Two more physician chemists may complete our series—William Hyde Wollaston (1766-1828), a Fellow of this College, a most eminent man of science, whose contributions extend over physiology and pathology, mineralogy, optics, botany, and, above all, chemistry; and William Prout (1785-1850). Wollaston discovered the malleability of platinum, a property of great value to chemists and physicists alike, detected cystin in urinary calculi, and invented the camera lucida. Prout was one of the founders of biochemistry, and discoverer of the hydrochloric acid in the gastric juice. His much discussed hypothesis, usually spoken of as "Prout's law," that the atomic weights of other elements are multiples of that of hydrogen, and that hydrogen is the basal substance from which all the other elements are formed, has long served as a potent stimulus to observation and research, and now, in a sense, is coming to its own.

In these later days the ties between medicine and chemistry are being knit more closely than ever before. Most drugs of recent introduction are, like aspirin, by-products of the gas-works or dye factory, or, like salvarsan and its allies, synthetic products of the laboratory. But far more important to the progress of medical knowledge is the light which is being thrown, by the rapid advance of biochemistry, upon the problems of metabolism and chemical structure of the body.

The history of other sciences tells a like story. Almost all the early botanists were medical men, and the chief stimulus to the study of botany was the search for useful drugs. This is true even of classical times, the days of Theophrastus and of Dioscorides. The early scientists were with few exceptions, such as Archimedes, observers rather than experimenters, and the mere differentiation and naming of genera and species—a branch of science which dates back to the Garden of Eden, and of which that great naturalist, Linnaeus, was a brilliant exponent—afforded an immense field of work. Of the *Materia Medica* of Dioscorides Charles Singer writes: "Its history has shown it to be one of the most influential botanical treatises ever penned. It provided most of the little botanical knowledge that reached the Middle Ages. It furnished the chief stimulus to botanical research at the time of the Renaissance." In the fifteenth and following centuries a long line of medical botanists carried on the tradition, including Brunfels (1484-1534), Fuchs (1501-1566), Bock (1498-1554), and Gesner (1516-1565), the most learned naturalist of his century, botanist, zoologist, artist, and professor of Greek, who died of plague whilst faithfully carrying out his duty, as town physician at Zürich, during an epidemic of that malady.

But to quote Miall once more: "It was generally believed that for every ill that flesh is heir to, Nature had designated some plant as the appropriate cure"; and again, "Some believed that Providence had caused particular plants to grow in those districts where the diseases which they cure are prevalent." Can it be denied that such tenets are held by millions at the present day?

The high distinction of having initiated the study of vegetable anatomy and physiology, those higher branches of botany, is shared by two men of the seventeenth century, both of whom were physicians. One of them, Nehemiah Grew (1641-1712), we may proudly claim as a Fellow of our College. He it was who first recognized the sexes of plants and the functions of the stamens, but he himself gives some of the credit for this to our former President, Thomas Millington. Of Grew, Hallam wrote that "no man, perhaps, who created a science has carried it farther," but he must share the renown with no less a colleague than Marcello Malpighi (1628-1694), in whose splendid record the study of plant anatomy takes but a minor place. A professor of medicine, zoologist, and botanist, founder of the science of embryology, elucidator of the structure of the lung, spleen, and kidney, to Malpighi must be assigned very high rank amongst those who have contributed to the advancement of natural knowledge.

On the other side, the greatest of systematic botanists, and founder of our system of nomenclature of plants and animals, Carl Linné, commonly called Linnæus (1707-1778), who has been said to have "found botany a chaos and left it a cosmos," was not only a doctor of medicine, but held the office of physician to the Swedish navy, and practised in Stockholm for a time.

The ties between medicine and zoology are less obvious, for the search for animal drugs can hardly have led anyone to the study of natural history. But the transition from human to comparative anatomy is easy, and there have been medical zoologists from early times. In the sixteenth century we find the names of Rondelet (1507-1566), Belon (1517-1564), Conrad Gesner once more, and of our own former President Edward Wotton (1492-1555), whose work, *De Differentiis Animalium*, gained for him a European reputation, but is marked rather by erudition than by originality of outlook and observation. In the seventeenth century there lived and worked Malpighi, whose chief contribution to zoology was a very complete study of the anatomy of the silkworm; Swammerdam (1637-1680), the Dutch microscopist who first observed the red corpuscles of the blood; and two Fellows of this College—Martin Lister (1638-1712), a man with wide interests and a special bent for the study of marine and freshwater molluscs; and Edward Tyson (1650-1708), the author of monographs upon the chimpanzee, porpoise, opossum, and rattlesnake, and who first described the patterns upon the finger-tips.

In recent times we may claim Richard Owen (1804-1892), who was credited with the power of reconstructing an extinct monster from a single bone; and also one whose eloquent words still ring in the ears of some of us, the greatest of medical zoologists, Thomas Henry Huxley (1825-1895).

In reality, botany and zoology are far more closely allied to medicine than our fathers knew. Since most maladies are due to invasion of the body by lowly organisms, some animal and some vegetable, we need to approach the study of disease from the standpoint of the invaders which are ever trying to gain a foothold, as well as from that of the tissues which resent the role of a culture medium and offer all the resistance in their power. In that struggle, which is waged with varying fortunes, we physicians are the allies of our patients, whose own tissues play the chief part in the defence. In order that our aid should be as efficient as possible we need to know all that can be learned about the nature and habits of the invaders, and of the insects which are the other hosts of some of them; and the study of bacteria is a branch of botany, and that of protozoa of zoology.

At the renascence of the medical sciences it was in human anatomy that the first advances were made, and the new anatomy was based upon dissection of the human body. The pioneer of this advance was Andreas Vesalius (1514-1564). His work was carried on in Padua. Others had dissected the human body before him, in Alexandria and at a later time in Bologna, but the prevalent teaching of anatomy followed the text of Galen, and was based, almost wholly, upon dissections of monkeys and lower animals. From Vesalius dates the great period of the medical school of Padua, during which there taught there, after Vesalius, Fallopius (1523-1562), Fabricius of Aquapendente (1537-1619), Casserius (1561-1616), and Spigelius (1578-1625)—men whose names are written large upon the organs and tissues of the body. To Padua also, despite the difficulties, discomforts, and even dangers of travel in those times, came students from afar, and amongst them our own Thomas Linacre, John Caius, and William Harvey. As Sir Clifford Allbutt justly said, in his notable Harveian Oration, delivered a quarter of a century ago: "It was in Padua that medicine, long degraded and disguised, was now to prove her lineage as the mother of natural science, and the truth of the saying of Hippocrates, that to know the nature of man one must know the nature of all things."

It is not necessary that I should dwell upon the share of medical men in the building up of modern physiology, for from Harvey onwards it has been almost entirely their work; but the day has passed in which physiology was regarded as the handmaid of medicine, and it has taken its proper place as a great independent science.

Morbid anatomy, as an adjunct to clinical medicine, dates back to the illustrious Morgagni (1682-1772), and so to Padua once more, and is intimately associated with the other great names of Albert von Haller (1708-1777) and Rudolph Virchow. Knowledge of the changes, both great and minute, wrought by disease in the organs and tissues is still as essential as ever in the training of the physician and surgeon, but morbid anatomy is no longer coextensive with pathology, and the pathology of to-day has entered upon entirely new fields. So, as we well know, modern pathology has rendered possible the destruction of the agents of disease, or of their insect hosts before they reach the body—the triumphant achievements of preventive medicine. Moreover, as the result of the study of immunity, the bacteriologist is teaching us how to apply Nature's own selective remedies in place of the cruder drugs of earlier days. At the same time, the pharmacologists are bringing to the test of scientific method the actions and uses of drugs which have long been used in an empirical way, and are able to explain the proved utility of some which owe their introduction into the pharmacopoeia to superstition, or to some grotesque hypothesis.

So, from the foundations of chemistry, physics, and biology, through the lower stories of human anatomy and physiology, of pathology and pharmacology, we reach the attics once more, and come back to Hippocrates, to the bedside examination of the sick and injured. But, now that the foundations have been well and truly laid, the clinical medicine of to-day is able to advance on scientific lines, and the study of the abnormal can be based upon a knowledge of the normal.

All who have taken part in this work, all those heroes of science and medicine whose names have been mentioned, may rank as benefactors of this College, both those who were its Fellows and those who were not, and in commemorating them I may claim to have followed Harvey's first injunction.

It is natural, nay inevitable, that as medical science grows and advances, some of the workers in the field should elect to follow the path which leads through the laboratory, whereas to others the wards make a stronger appeal; and thus is taking place a differentiation of medical workers into distinct groups, and there is danger that the fission may go too far. The worker in the laboratory, wedded to his more exact methods, and distrustful of those with which the clinician is often compelled to be content, is apt to place his bedside colleague in a lower grade or caste than his own. He is apt to look too much at the disease and too little at the patient, and to forget how greatly the former is shaped by the reactions and idiosyncrasies of the latter.

We all know that a line of treatment resting upon a strictly rational basis may be useless or even harmful in an individual case. It would be nothing short of a calamity were all the best scientific workers who enter our profession to be diverted from its clinical side to laboratory investigation, for of no walk of life is it more true than of the practice of our art that "the multitude of the wise is the welfare of the world." From the ranks of the clinical workers have been drawn those who, in the past, have built up medical science. It was in the intervals of their clinical practice that such men as Harvey himself, William Gilbert, Nehemiah Grew, and Thomas Young carried out the researches which have made them for ever famous; and, indeed, clinical medicine is itself essentially scientific.

But clinical medicine is an art as well as a science, and in the sick-room many qualities are called for which are not essential in the laboratory. A man who is deeply imbued with the spirit of science may prove a very poor practitioner, whereas another, rich in common sense, sound knowledge, experience, and human sympathy, but to whom abstract science makes little appeal, may make a very good one. Tact and equanimity, courage and restraint, patience with fads and sympathy with grief, diagnostic skill and manual dexterity are qualities called for in the daily work of the practitioner of medicine or surgery. The marvel is that, on the scientific side, he has accomplished so much, not that he has failed to accomplish more. It ill becomes his colleagues in the laboratory to think slightingly of him.

Medicine, indeed, embraces a number of constituent sciences, and for the attainment of her beneficent aims all her branches need to work together in mutual respect, amity, and concord; to bear in mind Harvey's third injunction to that effect, and his reminder that: "Concordiâ res parvæ crescunt, discordiâ magnæ dilabuntur."

Not only are the diagnostic methods which we employ in accord with the demands of science, but also, by the bedside study of signs and symptoms, and the recognition of the morbid anatomical changes with which they are associated, as also by the observation of the effects of surgical removal or gunshot injury of parts, very notable contributions to physiology have been made.

Consider for a moment how our knowledge of the functions of the endocrine glands has been obtained. The acumen and care in observation of that splendid clinician Addison threw the first ray of light upon the subject, and removed the adrenal glands from the realm of mystery into that of observed fact. The gradual accumulation of facts concerning exophthalmic goitre, Gull's discovery of myxœdema, Kocher's observations upon cachexia strumipriva, and the effects of thyroid treatment, provide a connected story of clinical work in medicine and surgery, which led up to a solution of the functions of the thyroid gland, and which had its practical outcome in the restoration to health of many sufferers from myxœdema, the rescue of many cretins from imbecility and arrest of growth, and the amelioration of the lot of many sufferers from Graves's disease. Again, it was the recognition of acromegaly by Pierre Marie, the study of its symptoms and morbid anatomy, the recognition by Fröhlich of the syndrome which bears his name, and that of the other results of pituitary defect, together with the surgical results of Cushing and others, which led us to our knowledge of the functions of the hypophysis, knowledge which has been greatly extended by the experimental work of Schafer. Moreover, the inklings we have of the functions of the pineal gland, and of the adrenal cortex, are mainly derived from clinical observations of patients with tumours of those structures.

The chance that an accidental gunshot wound left the French Canadian Alexis St. Martin with a gastric fistula, and that the American army surgeon Beaumont, under whose care he came, was able to take full advantage of the opportunity so afforded of studying the secretion and action

of the gastric juice, proved of the utmost value in the elucidation of the problems of digestion. And in these times many clinical devices, such as test meals, duodenal soundings, and bismuth meals, are throwing yet further light upon physiological as well as pathological processes.

The knowledge acquired in recent years of the mechanism of the heart's action is a triumph of scientific clinical medicine. This work, which is so closely associated with the names of James Mackenzie, Thomas Lewis, Wenckebach, and Einthoven, has been gained mainly by the study of derangements of the heart's beat in man, by means of the polygraph and electro-cardiograph.

But perhaps the most striking examples of all are afforded by the work which has been done upon the nervous system. Bouillaud described clinical and pathological physiology as the sister of experimental physiology, and since the middle of the nineteenth century an immense amount of knowledge of the functions of the brain and spinal cord has been acquired by the labours of a band of brilliant investigators, many of whom are our own countrymen, and most were, or are, physicians or surgeons. Of these I may mention Hughlings Jackson and David Ferrier, Charles Beevor, Victor Horsley, and Henry Head in this country, and on the Continent, Hitzig, Erb, Westphal, and Pierre Marie. By their researches they have furthered the work of the pure physiologists, Sherrington, Gaskell, Langley, Gotch, and others.

As regards localization, the first definite steps indicating that the brain does not function as a whole, but as a congeries of organs, was the localization by Broca of the motor speech centre, in 1861, which was based upon the position of the local lesions in fatal cases of aphasia, and Hughlings Jackson's study of convulsions due to cortical lesions. These observations served as stimuli and pointed a way which was followed by many other observers, but by a not unfamiliar irony of things the assignment of a speech centre to the convolution of Broca no longer meets with acceptance.

Lastly may be cited the work of Head upon the seats of pain due to visceral lesions, and upon epicritic and protopathic sensations. It is clear that clinical observation is the royal road to the study of many kinds of sensory disturbance, in which an intelligent subject who can describe his sensations is needed, and in some instances the investigators have controlled their clinical observations by experiments upon themselves.

The examples quoted show that, apart from the study of disease in bulk, and by statistical methods, there is also much to be learnt from the detailed study of individual cases.

In a letter which Harvey wrote only six weeks before his death, to a Dutch physician who had sent him an unusual specimen, occurs the following passage: "It is even so—Nature is nowhere accustomed more openly to display her secret mysteries than in cases where she shows traces of her workings apart from the beaten path; nor is there any better way to advance the proper practice of medicine than to give our minds to the discovery of the usual law of Nature, by careful investigation of cases of rarer forms of disease. For it has been found, in almost all things, that what they contain of useful or applicable is hardly perceived unless we are deprived of them, or they become deranged in some way."

These words, as true to-day as when they were written, are full of encouragement for those of us for whom the study of Nature's experiments and mistakes has a special attraction. The structural malformation, or the hereditary and inborn departure from the normal of metabolism, although unimportant from the practical standpoint, may throw a ray of light into some dark place of embryology or biochemistry; and not a few of the rare maladies, such as chloroma, polycythaemia vera, sulphæmoglobinæmia, and the disease of which Bence-Jones albuminuria is a sign, offer fascinating and still unsolved problems of physiology and pathology.

Obviously clinical medicine presents immense fields of scientific research, and those who cultivate them have the added satisfaction of knowing that every advance of medical science will, sooner or later, bring in its train some forward movement of the healing art.

So, as we trace the history of natural science down through the centuries, we are confronted at every stage by the influence of medicine upon its progress. The desire to alleviate human suffering, to repair the ravages of disease, and to mend the broken part, has served as a powerful stimulus to observation and experimental work. It soon became obvious to the would-be healers that to understand disease they must needs understand the healthy workings of the organism, and that pure science must precede applied. So, as Huxley said, medicine became the foster-mother of the sciences. But she became their schoolmistress also, and attracted to herself men whose scientific abilities would hardly have found an outlet in the other walks of life open to them in the earlier days, and them she not only taught but supplied with means of livelihood whilst they pursued their chosen studies. Her part was rather that of a mother than of a foster-mother. They, in their turn, repaid her care by laying firm foundations upon which a rational healing art could be built up, and, as we have seen, not a few of them achieved epoch-making results in sciences outside the range of medicine.

Thus it has come about that immense, and indeed incalculable, as is the debt of medicine to the pure sciences, the debt of science to medicine is hardly if at all less great. But these mutual obligations are but internal debts, and the fact that medicine, in its widest sense, is merely a branch of natural science was recognized even by Aristotle, who, at the end of his work on respiration, wrote as follows:

"Our discussion of life and death and kindred topics is now practically complete. But health and disease also claim the attention of the scientist and not merely the physician, in so far as an account of their causes is concerned. The extent to which these two differ, and investigate diverse provinces must not escape us, since facts show that their inquiries are, to a certain extent at least, conterminous. For physicians of culture and refinement make some mention of natural science, and claim to derive their principles from it, while the most accomplished investigators into nature generally push their studies so far as to conclude with an account of medical principles."

Yet, as Huxley pointed out, "It is a peculiarity of the physical sciences that they are independent in proportion as they are imperfect; and it is only as they advance that the bonds which unite them become apparent." That this is so is far more obvious to-day than when these words were spoken more than forty years ago. For as we gain more knowledge innumerable fresh links are brought to light; and the unity of natural science is daily being revealed more clearly as the boundaries of its several branches fade and become indistinct.

Few will any longer question the view that physiology is merely the chemistry and physics of living things. Physics has captured the structure of the atom, is absorbing chemistry into itself, and is becoming revealed as the great fundamental science, of which all the others are but branches. In this great complex of interlocked studies those which we class together under the comprehensive name of medicine have their allotted places, and advance in any one branch forwards the progress of the whole. To take our part in this progress is alike our privilege and our obligation as members of the great band of seekers after natural knowledge.

Upon the ceiling of the cloister of the University of Padua there are painted "stemmata" which record the sojourn there of many students who were councillors of their several "Nations," and amongst them are two which bear the name of Gulielmus Harveus, Anglus. Some of the designs are heraldic, but Harvey's is symbolic, nay prophetic. A right arm and hand holds up a caduceus, in which, in place of a lifeless staff, the twin serpents are entwined around a lighted candle which throws out beams in all directions. What more fitting emblem could have been devised? And yet these stemmata were painted when Harvey's work was scarce begun, and when he was still a member of the student body. To "search and study out the secrets of Nature by way of experiment" was his own way of life, and it is my duty to obey his injunction, and to exhort our younger brethren in the College to tread the path in which he led the way, and to see to it that in their hands the flame which Harvey lit shall burn as brightly as in Harvey's day.

FOUR CASES OF EXOPHTHALMIC GOITRE TREATED WITH INSULIN.

A Preliminary Report to the Medical Research Council.

BY

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THE idea of treating hyperthyroidism with insulin was founded on the hypothesis of an antagonism between the hormones of the thyroid and the pancreas. Such an hypothesis admits of no definite proof, but the pathological and experimental evidence in its favour seemed to warrant the hope that insulin might prove useful in the treatment of hyperthyroidism and exophthalmic goitre. Since this work was begun, Goffin[1] has published a report of four cases of Graves's disease treated with insulin, three of which were greatly ameliorated. His work may be criticized on the grounds that no estimations of basal metabolism were made and therefore hyperthyroidism was not definitely established, nor is there a record of the conditions of his experiment being carefully controlled. Of the four cases here reported two were successful, and, though it is too early to generalize on these few cases, they seem to give an indication of the type of case most likely to benefit from insulin. As each case requires very thorough and prolonged investigation to be of real experimental value and few can be adequately undertaken at a time, the following four cases are recorded now in detail in the hope that others may be tempted to investigate the question.

Evidence of an Antagonism between the Thyroid and the Pancreas.

The clinical picture of hyperthyroidism and exophthalmic goitre is well known. The condition is due to an increased production and perhaps a qualitative change in the specific hormone thyroxin, an iodine compound. When this is present in excess, as in exophthalmic goitre, the metabolism as judged by the minimal heat production—the basal metabolic rate as it is called—is markedly increased, katabolism exceeds anabolism, the tissues are rapidly broken down and nitrogenous excretion is increased, weight is lost, the pulse and respiration are rapid, and the temperature often elevated. In brief, thyroxin acts as an excessive draught to the fires of the body. In addition, the sympathetic system is over-active, and to this the symptoms of nervousness, tremors, and exophthalmos are commonly ascribed. The carbohydrate metabolism is frequently upset and spontaneous glycosuria and hyperglycaemia may occur. More often this appears only on a glucose tolerance test, which shows a high and prolonged blood sugar curve. Usually the fasting blood sugar is normal, and it would seem that the oxidation of carbohydrates is normal and only the glycogenic function[2] of the liver defective at first. This may lead subsequently to a true diabetes mellitus, presumably by prolonged overstrain of the pancreas.

On the other hand, although we do not know of any condition of excessive production of insulin by the body (hyperinsulinism), the effects of insulin are the opposite of thyroxin in several directions. Its total effect on metabolism apart from diabetes is little known, but it would appear to retard metabolism, especially when the blood sugar is reduced to a low level (Macleod, 1924). Its effect on the weight of non-diabetics is also unknown, although Harrison[3] has failed to fatten rabbits on large doses of insulin. But Garrelon and Santenoise[4] have recently shown its action as a vagotonic agent, apart from its hypoglycaemic effect, but owing to the importance of its therapeutic possibilities this point requires confirmation. Certainly some of the early symptoms of hypoglycaemia—the hunger pains, the occasional colic, and the heavy slow palpitation—are suggestive of parasympathetic vagus stimulation, the opposite of the sympathetic effect of hyperthyroidism. Insulin reduces the blood sugar and undoubtedly restores the glycogenic function[2,5] of the liver of a diabetic, or at least enables it to store glycogen. Loewi's adrenaline eye test for dilatation of the pupil may be cited as further evidence, for in Graves's disease it is often positive from increased sympathetic tone, and in diabetes (hypoinsulinism) often positive from failure of the pancreatic hormone to counterbalance the sympathetic tonus—or so the theory goes.

Some experimental work on animals is definite in support of a thyroid insulin antagonism. Duchenеau[6] showed that thyroidectomy makes rabbits more sensitive to insulin. Burn and Marks confirmed this,[7] and went further by showing that thyroid feeding makes a thyroidectomized rabbit again more insensitive to insulin. Falta[8] states that—

> "extirpation of the thyroid raises the assimilation limits for carbohydrates and reduces the protein metabolism during fasting. Extirpation of the pancreas reduces the assimilation limits very strongly and increases the protein metabolism during fasting. Simultaneous extirpation of the thyroid and pancreas produces indeed a diabetes; this, however, pursues a milder course to the extent that the increase of the protein destruction is not so high and the diminution in weight does not increase so rapidly. . . ."

Friedman and Gottesman[9] have recently confirmed this. There is thus much scattered evidence to suggest a correlation between the thyroid and the pancreas, but so far mostly that the thyroid is an antagonist to insulin than the other way about.

Plan of Author's Investigation.

Spontaneous variations in the clinical condition of a case of Graves's disease are notorious, and the consequent difficulty in estimating the specific effect of any treatment is recognized. In this investigation care has been taken to allow time for the preliminary improvement that rest in hospital usually brings about before starting insulin treatment. The patients were placed on a fixed diet to avoid changes in weight and metabolism due to diet alone and to make it safe to give large doses of insulin with blood sugar control. Improvement was to be judged by changes in the general condition of the patient, the size of the thyroid, the nervous symptoms, the weight and the pulse rate, and, most important of all, the basal metabolic rate. It was intended to estimate the nitrogenous excretion also, but so far this has not been done. All the patients were confined to bed throughout the investigation, and indeed were too ill to be allowed up. The progress of the cases is recorded in the tables, which show the weekly change in weight, morning and evening pulse rate, basal metabolic rate, the units of insulin per day, and the respiratory quotient. The modified Tissot spirometer supplied by the Sanborn Company was used for the basal metabolic estimations and the air analysed in a Haldane's apparatus. The tests were carried out uniformly sixteen hours after the last meal, although a cup of tea was allowed four hours before the test for the comfort of the patient and seemed to make no difference. As all the patients presented ocular and nervous symptoms, tremors, tachycardia, and dilatation of the heart, and enlarged thyroid, these are not mentioned again in detail unless of special interest.

CASE I.

An unmarried woman, aged 23, was admitted to hospital on April 29th with a history of swelling in the neck since childhood, which had rapidly enlarged and begun to cause symptoms only in the last six months. She presented all the cardinal symptoms of exophthalmic goitre; the right lobe was more enlarged than the left and caused deviation of the trachea and dysphagia. The apex beat was 4½ in. from the mid-sternal line. She did not improve under medical treatment, and in Dr. Firth's opinion was too bad a surgical risk for operation. I wish to take this opportunity of expressing my indebtedness to him throughout this investigation, and especially for help in the estimations of basal metabolism. She had no glycosuria and neither fasting nor post-absorptive hyperglycaemia.

Before starting insulin her average diet was observed for several days, and estimated at 350 grams of carbohydrate, 120 grams of protein, and 150 grams of fat. She was accordingly placed on this diet arranged in four meals in the day (that is, 80 calories per kilogram of body weight) and insulin A.B. commenced with 15 units twice a day before breakfast and tea. Her progress is shown in Table I. I do not think that the beneficial suggestive element of the injections has to be reckoned with, as she had been having other

injections before and hardly knew they were changed. Yet even after four days of insulin she was positive that the neck was less tense and that she could swallow better. The insulin was increased in ten days up to 90 units, and four days later she had mild symptoms of hypoglycaemia (blood sugar 0.069 per cent.) coinciding with the use of a new batch of insulin. The dose was subsequently dropped to 80 units, which caused no inconvenience either locally or generally.

At the end of three weeks the tremors and exophthalmos were quite gone and she felt much better and walked better. The basal metabolism had dropped, but the pulse rate took longer to follow suit. As she felt very hungry (an insulin effect) her diet was raised at the fourth week by 100 grams, after which she increased much more rapidly in weight. Her general improvement was marvellous; insulin was discontinued after nine weeks, but her progress was still maintained, and all this during the hottest period of the summer, which is often fatal to these cases. The thyroid obviously diminished in tenseness and size; but the measurements were unfortunately not made by the same person throughout the investigation and vary too much to afford any real indication. As her weight increased the added fat tended to mask any diminution in the size of the gland, but at the end of her treatment it was still slightly enlarged. The heart had returned to the normal position, and the pulse rate remained steady during the last fortnight, when she was allowed to walk about the ward.

TABLE I.

Weeks.*	Weight in lb.	Pulse.		Basal Metabolic Rate per Cent.	Respiratory Quotient.	Insulin Units per Day.
		Morning.	Evening.			
7	111	116	122	—	—	0
4	98	120	120	+66	0.74	0
2	95	112	108	—	—	0
1	92	100	120	+58	0.71	0
0	91	114	122	—	—	30 to 50
1	90	100	128	+41	0.79	70 to 80
2	93	96	120	+33	0.82	90
3	95	104	120	+19	0.76	80
4	97	80	120	+14	0.78	80
5	100	88	100	+13	0.87	80
6	105	84	100	+24	0.83	60 to 40
7	112	92	72	+24	0.81	40 to 20
8	117	84	96	+27	0.77	20 to 0
9	119	88	108	+16	0.77	0
10	125	78	100	+13	0.79	0

* Weeks before and after insulin treatment. Insulin commenced at 0. This applies to the four tables.

CASE II.

A married woman, aged 28, was admitted to hospital with a history of swelling in the neck for six months and exophthalmos and extreme nervousness since a miscarriage three months ago. The Wassermann reaction was negative. She was excessively nervous and restless on admission and the heart was slightly dilated. She had glycosuria (2 per cent. in the twenty-four hours urine), normal fasting blood sugar but hyperglycaemia after meals. The variations in the carbohydrate metabolism throughout the experiment are very interesting.

After two weeks of rest her basal metabolic rate had become stable, and she was put on a diet of 350 grams of carbohydrate, 120 grams of protein, 150 grams of fat, and 40 units of insulin given in two doses. She became sugar-free in three days and developed an enormous appetite, an effect which insulin produced on three of the four cases. Instead of losing weight she gained a pound in the first four days. Accordingly 100 grams of carbohydrate were added to her diet in the form of bread and the insulin raised gradually to 100 units a day. At the end of the second week she had greatly improved; she had gained 5 lb. and the pulse and basal metabolic rates were dropping. The fasting blood sugar was normal, and five and a half hours after the morning dose of 50 units was 0.074 per cent. She never had any hypoglycaemic symptoms, except that she was always very hungry even after a large meal. I had now got her into the state at which I was aiming, in which I hoped insulin would have its maximal beneficial effect either by the low blood sugars *per se*, by a direct antagonism to an excess of thyroxin, or by its general restraining influence on metabolism. It seemed to be having the desired effect, but she then received some very worrying domestic news which upset her completely, and she relapsed in every way except that she still continued to gain weight. She was kept on the same diet, and in spite of 100 units of insulin a day began to pass much sugar in the fourth week, and by the end of the fifth week the blood sugar was 0.179 per cent. fasting level, and 0.372 per cent. two hours after dinner—figures which showed that the condition of the carbohydrate metabolism had become typical of diabetes rather than of hyperthyroidism. The interesting question arises whether this was caused by the mental upset, by an increased secretion of thyroxin rendering the insulin ineffectual, or by a diminished tolerance accompanying the rise in weight, or by a combination of these factors. The carbohydrates were reduced to 350 grams a day in the fifth week, to 250 grams in the sixth, and 200 in the seventh week, but in spite of the large dose of 100 units insulin a day, it was not till the eighth week that she became sugar-free with normal blood sugars. Her source of worry was removed in the sixth week, and after this she rapidly improved and felt so well that she decided to go home. In spite of a diet ample in bulk and calories she complained of always feeling hungry, even when the blood sugar estimates were high, an effect probably due to insulin apart from the blood sugar level, and noticeable in many diabetics under insulin. This, I would suggest, is a vagotonic effect. It is interesting to note that insulin raised the respiratory quotient markedly except in the fifth week, when the blood sugars showed her to be in a diabetic condition. She never showed any ketosis.

On discharge from hospital she declared herself better than she had been for months. Her muscular power had greatly improved and the tremors almost disappeared. The exophthalmos and the pulse rate were only slightly diminished. The circumference of the neck diminished one inch in spite of the fact that the weight increased 26 lb. The change in size and pulsation was most noticeable in the left lobe, but there was no sign of any residual adenoma in the right lobe to account for the fact that it hardly diminished at all.

The insulin was suddenly discontinued during the last three days, as the patient was anxious to leave, and slight glycosuria reappeared. It is hoped to continue the investigation of this patient as soon as she can be readmitted to hospital.

TABLE II.

Weeks.	Weight in lb.	Pulse.		Basal Metabolic Rate per Cent.	Respiratory Quotient.	Insulin Units per Day.
		Morning.	Evening.			
2	81	120	120	+61	0.74	0
1	79	112	120	+43	0.79	0
0	78	110	120	+41	0.75	40
4 days	79	112	120	+41	0.76	60
1	82	109	100	+30	0.81	60
2	84	90	120	+26	0.81	80 to 100
3	89	130	140	+46	0.85	100
4	93	120	115	+46	0.87	100
5	98	130	140	+35	0.77	100
6	100	122	120	+41	0.80	100
7	103	108	112	+35	0.82	100
8	105	100	120	+24	0.82	100

CASE III.

A married woman, aged 50, a severe case with marked tremor and muscular weakness, was admitted with a history of swelling in the neck, nervousness, and palpation for two years, and exophthalmos for sixteen months. A carcinoma of the right breast had been removed four years previously and showed no sign of recurrence. A deep-seated adenoma could be felt in the right lobe,

TABLE III.

Weeks.	Weight in lb.	Pulse.		Basal Metabolic Rate per Cent.	Respiratory Quotient.	Insulin Units per Day.
		Morning.	Evening.			
2	92	96	104	—	—	0
1	90	100	100	+42	0.77	0
0	89	96	100	+39	0.81	40 to 50
1	92	96	100	—	—	60 to 80
2	95	108	112	+46	0.82	80
3	98	96	104	+57	0.76	90
4	101	100	124	+66	0.74	90
5	104	104	142	+52	0.82	40
6	105	88	120	—	—	20
7	105	84	108	+46	0.77	20
8	105	88	112	+40	0.76	0

which was larger than the left. She had transient glycosuria, normal fasting blood sugar, but gave a typical prolonged curve of slight hyperglycaemia with 50 grams of glucose.

Insulin was commenced with 40 units on a diet of 450 grams of carbohydrate, 120 grams of protein, and 150 grams of fat—somewhat higher than she had been eating before. At first this proved too much for her, but her appetite improved as the insulin was increased to 90 units and she rapidly gained in weight. She did not improve in other respects, and after a month the insulin was reduced to 20 units a day. On this the gain in weight was not maintained, perhaps partly because appetite diminished, although she was still able to eat a very liberal diet. When insulin was discontinued her general condition was little if at all improved, although the tremors were appreciably less. The neck measurement remained unchanged, but it must be remembered that she had gained 14 lb. to offset this. The left lobe was decidedly diminished and the adenoma in the right lobe was more obvious, as the remainder of the lobe seemed to have shrunk. After the insulin was reduced below 40 units she ceased to gain weight but had no recurrence of glycosuria. The pulse and basal metabolic rate fell somewhat, probably because she began to sleep better under the influence of bromides.

CASE IV.

A married woman, aged 47, was admitted on May 26th with a history of dysphagia for eighteen months and noticeable thyroid enlargement and exophthalmos for twelve months. She presented all the symptoms of Graves's disease, and a dilated heart was found, but from the presence of several nodules in the thyroid she was rather a case of toxic adenoma than of simple exophthalmic goitre. Glycosuria and hyperglycaemia were absent. The Wassermann reaction was weakly positive, but this is common in hyperthyroidism, and no significance was attached to it.

She was treated with x rays for a month with no benefit, except that the thyroid became harder; she continued to lose weight, as shown in the table. Accordingly she was put on a diet of 350 grams of carbohydrate, 120 grams of protein, and 150 grams of fat—approximately what she was eating at the time—and 40 units, and later 60 units, of insulin were given. She got worse and developed pressure symptoms on the trachea, so that the insulin was discontinued after a month. Unlike the other three cases, she did not even gain weight appreciably, although the loss was checked for a time.

TABLE IV.

Weeks.	Weight in lb.	Pulse.		Basal Metabolic Rate per Cent.	Respiratory Quotient.	Insulin Units per Day.
		Morning.	Evening.			
3	79	96	98	—	—	0
2	76	100	100	+37	0.78	0
1	72	88	122	+34	—	0
0	71	92	93	+35	0.80	40
1	71	110	100	+50	0.82	40 to 60
2	72	98	92	+69	0.74	60
3	73	100	112	+64	0.79	60
4	72	106	120	+58	0.81	60
5	71	104	112	+61	0.77	20 to 0

The possible mode of action of insulin in hyperthyroidism, whether by direct chemical or physiological antagonism, by primary effect on carbohydrate metabolism, or as a vagotonic with a general anabolic action, will be discussed in a later publication when more evidence, including some animal experiments, has accumulated. But it already seems possible to correlate the results in these four cases with different types of hyperthyroidism. Two cases were successful, one strikingly so, and these were uncomplicated though severe cases of Graves's disease in young women. In one the carbohydrate metabolism was never abnormal, so that insulin did not act primarily by correcting this. The two unsuccessful cases were older women and the disease of longer standing. One of them, Case III, was definitely a toxic adenoma (Graves's syndrome associated with adenoma of the thyroid), and though she gained in weight and felt better she did not fundamentally improve. Case IV, a complete failure, was admitted as a case of toxic adenoma, but when I examined her after the thyroid had become hard, following a course of x rays, I could not be sure of this. Therefore it would appear that hyperthyroidism arising from an adenomatous condition of the thyroid is not likely to benefit from insulin, and that the most hopeful are simple cases of Graves's disease. Indeed, on *a priori* grounds, we could hardly expect insulin to influence an adenomatous condition of the thyroid to which the general metabolic disturbance seems to be secondary.

Nothing definite can be said regarding the dose of insulin. On theoretical grounds big doses would seem most likely to succeed, and certainly small doses were no more effective than large in Case III. Goffin, however, reports improvement in his cases with 10 units a day and never gave more than 20.

The rise in the respiratory quotient under insulin was marked in the two successful cases, but indefinite or absent in the failures. Such a rise may prove to indicate whether the treatment is likely to be successful in any case. It can hardly be due to the direct action of additional circulating insulin, as the estimations were made eighteen hours after the last dose of insulin. It would seem to indicate a check on the former excessive katabolism of protein accompanied by improved glycogenic function of the liver; or at least a storage of carbohydrate under the influence of insulin which remains available for oxidation even when the insulin effect wears off, as occurs in diabetes.

The gain in weight was striking in three of the cases, and in the first two was not due to any change in diet, because they were kept on the same diet before and after the commencement of insulin, and the gain in weight was evident before the diet was increased in rsponse to the appetite created by insulin. This suggests the use of insulin in the treatment of under-nutrition and emaciation in cases other than diabetes and hyperthyroidism. It is probable that insulin will acquire a much wider therapeutic field with the progress of time.

SUMMARY.

1. Four severe cases of Graves's disease with hyperthyroidism were treated with large doses of insulin, 60 to 100 units a day. The insulin was well borne and caused no inconvenience.

2. Two of the cases were greatly improved, one being practically normal on discharge from hospital. In both the disease was uncomplicated and of less than a year's duration in women under 30. It seems unlikely that their improvement was spontaneous or caused by any factor other than insulin.

3. The two others were not essentially benefited, although one gained much in weight and felt better. They were cases of toxic adenoma of the thyroid rather than of simple Graves's disease, occurring in women of about 50 and of over a year's duration.

4. The treatment was carried on under strict standard conditions of diet and close blood sugar control, but, should its value become established, these should hardly be necessary.

5. The subject is still in its experimental stage, and these four cases are recorded now mainly in the hope that other workers may investigate its possibilities.

I wish to thank the physicians of King's College Hospital for permission to observe these cases, the sister for her careful dietetic control, the house-physicians for their close co-operation, and Mr. L. Hewlett for many of the blood sugar estimations.

REFERENCES.

[1] Goffin, J.: *Le Scalpel*, April 19th, 1924. [2] Cramer, W.: *Proc. Roy. Soc. London*, 1913, 85, 550; and *British Journ. of Exper. Path.*, 1924, vol. v, p. 128. [3] Harrison, G. A.: Unpublished personal communication. [4] Garrelon and Santenoise: *C. R. Soc. de Biologie*, 1924, 90, 470. [5] Lesser, E. J.: *Die innere Sekretion des Pankreas*, 1923. [6] Ducheneau: *C. R. Soc. de Biologie*, 1924, 90, 248. [7] Burn, J. H., and Marks, H. P.: *Proc. Phys. Soc.*, 1924. [8] Falta: *Endocrine Diseases*, 1923. [9] Friedman and Gotterman: *Journ. Amer. Med. Assoc.*, 79, 1228.

THE seventh Congress of French-speaking Medical Practitioners in North America has recently been held at Quebec under the presidency of Professor Vallée of Laval University. The French Government was represented by Professor Sergent and Dr. Ribadeau-Dumas of Paris and Professor Jeanneney of Bordeaux, on whom honorary degrees were conferred. Papers were read on cancer, tuberculosis, and infantile mortality.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, BRADFORD, 1924.

SECTION OF OPHTHALMOLOGY.

A. MAITLAND RAMSAY, M.D., F.R.F.P.S., President.

DISCUSSION ON THE MICROSCOPY OF THE LIVING EYE.

OPENING PAPERS.

I.—BASIL GRAVES, *M.C.*,

Curator, the Royal Westminster Ophthalmic Hospital; British Medical Association Science Research Scholar.

THE PHYSIOLOGICAL ASPECT.

IT gives me great pleasure that I have been asked to contribute to the opening of this discussion. The restricting of my contribution to the subject of the living eyes which are normal has, however, rather taxed me to present to you, in the short time available, an aspect of the subject which shall be both concise and interesting. A full understanding of the normal effects is certainly a very necessary basis for the appreciation of what is pathological, but to summarize the various features seen in the different regions, from cornea and sclera right back to the retina and optic disc, would not be possible now; nor do I want to attempt it, because by now many of these features have come to be commonplace.

The comprehension of the diverse features met with in the microscopy of both normal and pathological living eyes reverts always to a proper understanding of principles of illumination, with particular reference to the subject of optical sections, using this term in its widest sense. At the annual congress of the Ophthalmological Society of the United Kingdom in Glasgow last May I brought forward certain clinical points in connexion with the optical section in the normal cornea. I propose now to take this opportunity to present only two features—one relating to the optical section of the normal aqueous fluid, the other to the optical section of the normal lens—to which, as far as I am aware, attention has not yet been drawn.

It is customary to regard the normal aqueous fluid as being non-relucent. That this is not so I think it will be possible, to-morrow, to demonstrate practically to those to whom it may be of interest. Mr. J. E. Barnard, F.R.S., for the assistance of whose opinions I have had occasion to be much indebted, tells me that he would not expect any body fluid to be optically empty; even the cerebro-spinal fluid is not so. Now I do not raise this point as a mere quibble; it is in my opinion a rather important point to recognize in the practical technique of this work—one which, as the cumulative evidence of various trained observers comes to hand, will possibly have an interesting clinical significance in relation to some varieties of intra-ocular disease.

Owing to the relucency of the cornea and lens, the visibility of the ribbon-like slit-beam, as it traverses these two structures, is relatively high. Between the planes of its passage through these the path of the beam, through the intervening normal aqueous fluid, is generally said not to be visible; this teaching arises from lack of suitable use of the facilities at our disposal. The normal aqueous fluid, though admittedly only very slightly so, is relucent. If the beam is to be seen traversing the normal aqueous fluid it is necessary that the field of observation shall include both an area of the fluid which is transmitting the beam, and, for contrast, above and below this, an area of fluid which is unilluminated by the passage of the beam. The observation of an area of the aqueous fluid, so illuminated by the ribbon-like beam that it more than covers the diameter of the field of observation, does not permit of visibility of the beam when the fluid is normal. (See Fig. 1, in which *c* represents cornea, *a* aqueous, *l* lens, and the dotted circle the limit of the field of observation.) Only when this fluid is very abnormal, so that from gross alteration of its colloid physical and chemical constituents it becomes relatively highly relucent, can the passage of the beam be appreciated under these conditions of observation; and such pathological pictures as that of Fig. 2* are already forthcoming commonly in

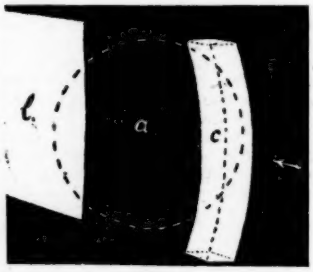


FIG. 1.

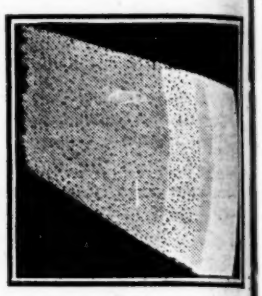


FIG. 2.

relation to uveitis in its severe—for example, sympathizing—forms.

To make the optical loading of the aqueous fluid more readily appreciable in its earlier and finer pathological stages the field of observation may be arranged according to the plan of Fig. 3, where the fluid is illuminated in one half—top or bottom—of the visual field, whilst no light is being transmitted in the fluid occupying the remaining half of the field. Now from the contrast thus afforded pathological relucency of the aqueous fluid will be appreciated in finer degrees than is possible under the conditions of illumination of Fig. 1; but even so, very fine degrees of increased relucency will not be appreciated thus, for more than one reason: first, a relatively large area of cornea and of, say, lens within the visual field is brightly illuminated, and this tends to impair the observer's dark adaptation so necessary for his recognition of very fine contrasts; secondly, it is possible that the total amount of light thrown into the observed eye, when the slit-beam is used, is such that the amount of reflection, diffuse or otherwise, taking place from the medium, be it iris or lens, behind the aqueous fluid, to some extent causes an illumination of that part of the fluid which is not transmitting the entering beam. I then made observations on the

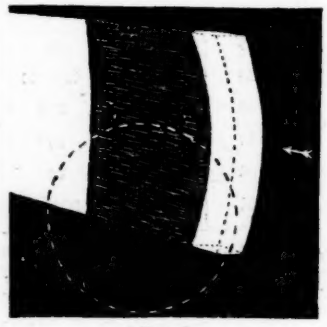


FIG. 3.

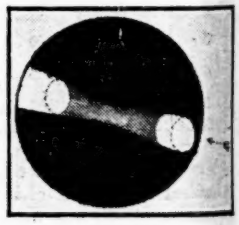


FIG. 4.

aqueous fluid by cutting down the vertical diameter of the slit-beam to a very small length, and finally I came to use a round beam of very small diameter. This is attained, when the ordinary pattern of the Zeiss make of nitra slit-lamp is used, by means of either the 0.5 or the 1.0 mm. dot-diaphragm. With the arc slit-lamp it is generally preferable to use the smaller of these two dot-apertures.

Now, using the ordinary nitra slit-lamp and the 1 mm. dot-aperture, the observer may see, as shown diagrammatically in Fig. 4,† the path of the beam traversing any normal aqueous fluid if he attends to these points, some of which are better demonstrated than described. It is essential that the filament of the nitra-lamp should be loaded to the maximum of its current-capacity; this generally neces-

* The long faint streaks in the beam represent shadow-streaks which were due to irregularities of surface contour caused by the recent instillation of a mydriatic in thick oily solution.

† In Fig. 4 the visibility of the aqueous-beam is drawn much exaggerated.

sitates altering the set-stop, inside the adjustable resistance, from the position it is in when sent out by the makers. Only a few seconds are necessary for the observer's dark-adaptation, but the room should be really dark. The observer should choose an angle of illumination which will not allow the specular reflection from the corneal epithelium to strike the microscope objective lenses, even though the reflected beam is not so directed as to pass along the axis of either of the objective tubes: the beam should be accurately focused in the middle depth of the aqueous fluid — that is, midway between cornea and anterior lens capsule; the beam, having traversed the aqueous fluid, should not strike the iris—a not uncommon error which gives rise to much diffuse reflection within the anterior chamber—but should pass on through the pupil into the lens, for which reason it is easier to observe the relucency of the normal aqueous fluid when the pupil of the observed eye is dilated. The observer, using preferably oculars No. 2 and objectives *a*2, should see the small round corneal beam just on the one side of his chosen field and the beam as it enters the lens on the other side, the illumination being focused midway between these two levels; he will then bring the microscope to a focus on the illuminated aqueous fluid by first focusing on the illuminated corneal patch or on the illuminated anterior lens-capsule, then deliberately racking the microscope a little forwards or backwards, as the case may be, to an extent which is really only guessed at but which becomes automatically accurate with practice. The necessary adjustments thus being made, the observer need attend to only one or two points in order easily to see the beam traversing the aqueous fluid: he should avoid certain fallacies due to reflections; he should make the slit-lamp arm oscillate slowly up and down so as to give movement to this faint beam which thereby will be seen the more easily; and finally, at least when a beginner, he should take observation with his own more appreciative perimacular field by directing his gaze deliberately a little above or below the level at which he seeks to see the beam. I myself from long practice feel that, given use of the same instruments under the same conditions, I can judge of a very slight range within which the relucency of the normal aqueous fluid, though slightly variable, may be said to be normal. All this might be no more than a scientific curiosity were it not for the fact that slight pathological increase in the relucency of the aqueous fluid occurs in various abnormal conditions, an account of which has not, so far as I am aware, yet been forthcoming. I have long made this a subject of clinical observation, and I am still doing so, for there are many points in connexion with it which I wish yet to find out, concerning not only the conditions in which this pathological increase of relucency occurs, but particularly also the incipient stages in such diseases at which this sign first manifests itself. I touch on this aspect of the abnormal only to emphasize how desirable it is clinically for the observer so to have trained himself that he can appreciate the range within which the relucency of the aqueous fluid may be said to be normal.

It should be understood that when speaking of this visibility of the path in the normal aqueous fluid I speak of a homogeneous "flare"—the "outstanding beam." The brightness of this flare is variably increased in various pathological conditions. Writings on pathological conditions show lack of proper distinction between the visibility component due to the flare and that due to discrete particles which are visible as such; both factors can contribute to visibility of the path in pathological states, but commonly the former exists alone. When the arc slit-lamp is used occasional isolated illuminated particles may be seen to cross the beam-track even in an eye which may be presumed to be normal; I believe that such particles, when very few and when unaccompanied by any increase in the visibility of the normal homogeneous flare-component, are not necessarily indicative of past or present intraocular trouble. With certain reservations, the discrete particles are generally seen better when illuminated by the ribbon-like slit-beam than by the pencil-like dot-beam. I might here add that, as Mr. J. E. Barnard informs me, the visibility, when due to particles of an order of size and distance of separation which is below the lowest limit admitting of resolution, is due to scattering of light; but that in the case of particles which are visible as such their visibility is due to diffraction.

I will now refer to the second point which I wish to introduce to-day. A problem which interested me early in the study of the optical section of the lens was this: any observer may notice, early in his experience, that there is an inconstant feature of the optical section of the posterior, and sometimes anterior, lens-cortex—namely, that a restricted portion of this will often differ from the rest of the lens section by having an almost metallic lustre. This may be seen at its best in many a senile cortex; but you may also sometimes see it, though it is more delicate and elusive, in the cortex of some young people. Not only does the extent to which this phenomenon is seen vary in different individuals, but its manifestation varies in the same individual according to the optical conditions of adjustment of the slit-lamp apparatus. Let Fig. 5 represent the optical section in the posterior part of a lens; let *c* be the capsular line and *r* the subcapsular or reduplication line, the posterior cortex being represented by an area in front of *r*. At times, and in certain individuals, you will find that a variably restricted area, which for diagrammatic purposes we may represent by *s* in the optical section, comes to assume a "metallic" lustre, in colour sometimes faint and golden, sometimes rich and copper-bronze. I need not go into all the explanations by which early I tried to satisfy myself as to what this meant. I first wondered if it could be due to some phenomenon of scattering, by structural elements in the cortex, of the light which, after being specularly reflected from the posterior capsule, was passing on its return journey forward; but this clearly was not the case, because, in the first place, the phenomenon, somewhat modified, is seen in the anterior cortex, which, in most lenses, is not bounded posteriorly by any surface of high specularly reflecting quality as is the posterior cortex by the posterior capsule; and, moreover, were this the explanation, this appearance would be situated within the optical section itself only when the incident axis of illumination corresponded with the normal to the curve of the posterior capsule.

FIG. 5.

In one of the first cases in which I noticed this appearance in a young person it took the form of quite a narrow vertically disposed band, and, as another explanation, I wondered if its plane might be transposed transversely to the plane of the sectional beam and whether it might be due to a single additional reflecting surface situated just in front of the line *r*; for when this area *s* chances to be narrow it is by no means easy, for one not knowing its proper explanation, to say whether the lustrous area is disposed transversely or anteroposteriorly, especially because its appearance is modified by the chosen angle of observation, and therefore its stereoscopic appreciation is inevitably difficult when the observer is using a binocular microscope whose objectives are disposed at different respective angles.

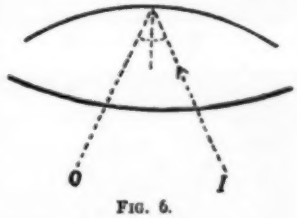


FIG. 6.

I next found that this appearance reveals itself nearly in its greatest intensity when the posterior capsule behind it is being viewed along the axis of its specular reflection; in Fig. 5 *s'* represents the small area of the posterior capsule which is being viewed thus—that is, it is being viewed by ordinary direct illumination (Fig. 6), with the added necessary condition that the chosen axis of observation through the microscope makes with the normal a plane-angle equal to that made by the incident axis of direct illumination. Furthermore, the metallic cortical lustre disappears

when the relation of these angles differs widely from that necessary for seeing the posterior capsule in its specular reflex. This provided the key to the explanation of this manifestation in the optical section of the cortex. It is impossible now to go into the many aspects of this phenomenon, all of which are accordant with an explanation that it results from a summation of successive multiple specular reflections of a sort which, under the conditions I have named, occur from the stratified or laminated structural elements of which the cortex is built. This conception is represented purely diagrammatically in Fig. 6A. For example, the appearance is seen in general over an area of the beam which, though restricted in its extent, is nevertheless vertically much wider than would correspond with the size of the particular area of the posterior capsule behind it, which for the moment is seen in the axis of its specular reflection; this is because the cortical laminations are not so regular in their curved configuration, and it may be also that if approximately regular they differ slightly in the radius of their curvature from that of the capsule. Again, the manifestation disappears from any given region of the observed lens as this is tilted by making the patient move his gaze up or down a given vertical line, the lustrous area remaining, so to speak, in the "beam-region," but changing its disposition by a movement which is modified by, but does not accompany, the apparent direction of motion of the cortex. I may illustrate this by the three Figs. 7A, 7B, 7C. It is assumed that the slit-lamp arm and the axis of the observation system are in a horizontal plane, and that, without change in the angular disposition of these to the normal in the horizontal plane, Fig. 7A represents the appearance when the eye is looking upwards, 7B when it is looking horizontally, and 7C when it is looking downwards. In general, in a suitable case, more especially in one with a senile cortex, the specular manifestations, x, x′ might be seen to change their distribution and their position according to the vertical direction of the eye as shown in these figures, in which x and x′ are respectively in the anterior and posterior cortex, c and c′ representing the area of the anterior and posterior capsule respectively, which, under the conditions of the moment, is seen in the approximate axis of specular reflection. Space does not permit me on this occasion to give simple diagrams explaining this; but its explanation—as that of other features, such as differences between the manifestation as seen in the anterior and posterior cortex respectively, due partly to the laminations in the one being convex and in the other concave, and partly to a difference in their radius of curvature—and also that of certain changes which may be seen as age advances, may be based on the assumption of a summated specular manifestation occurring along the course of the sectional beam as the result of multiple lamination of structure. I have reason to suppose that from the years even of adolescence changes may occur in the character of the optical section of the cortex of some individuals whose explanation can be understood only on the basis of this view.

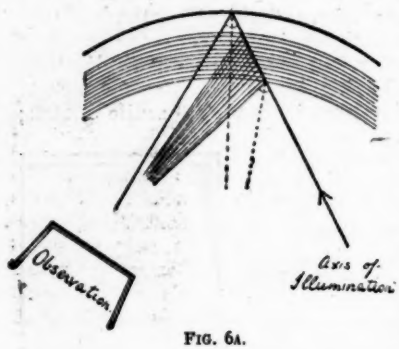


Fig. 6A.

Fig. 7A.

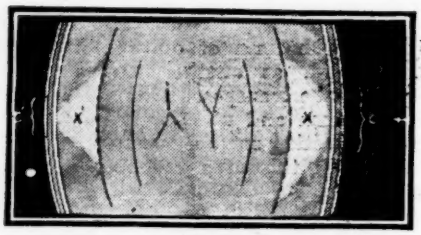


Fig. 7B.

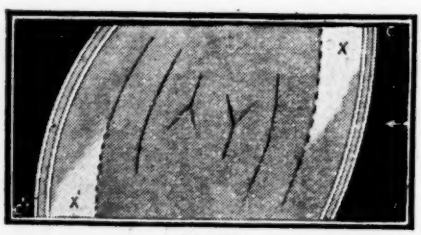


Fig 7C.

I think that prolonged observations by more than one observer will be required if it is to be ascertained why this manifestation should differ as it does in different individuals. Furthermore, I am not sure that prolonged study of many individuals may not lead to a recognition of presenile cataractous changes which might have some bearing on the prognosis as to the occurrence of senile cataract.

I would like to refer, in conclusion, to my indebtedness for the facilities which have been afforded me when pursuing this work at the Royal London Ophthalmic Hospital and at the Royal Westminster Ophthalmic Hospital.

II.—T. HARRISON BUTLER, M.A., M.D.Oxon.,

Surgeon, Birmingham and Midland Eye Hospital; Honorary Ophthalmic Surgeon to the Coventry and Leamington General Hospitals.

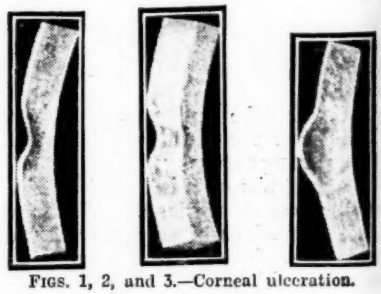
THE PATHOLOGICAL ASPECT.

Mr. Basil Graves has opened our discussion with a lucid account of some appearances of the eye as seen with the Czapski binocular microscope under the illumination of Gullstrand's slit-lamp. I thank you for asking me to continue the discussion from the pathological side.

It is obviously impossible for me in the short time at my disposal to do more than touch the fringe of this vast subject, and I propose to allude only to one or two abnormal conditions in each section of the eye: the cornea, anterior chamber, iris, lens, and vitreous.

Cornea.

The depth and extent of a corneal ulcer can be accurately measured by using a micrometer eye-piece, but from the clinical standpoint it can be estimated by mere inspection of the optical section of the cornea. If stained with fluorescein we can see that the green coloration passes along the lymph spaces and penetrates deeply into the substance of the cornea. This will explain how easy it is for septic material to spread in the tissues of the cornea, and why a septic ulcer so often gives rise to cyclitis with the formation of hypopyon. Figs. 1 and 2 show the appearance of a corneal ulcer, and Fig. 3 the heaping up of tissue that has followed the healing of an ulcer.

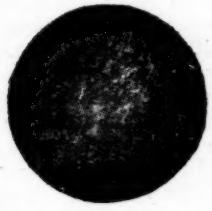

Figs. 1, 2, and 3.—Corneal ulceration.

Superficial keratitis takes many and varied forms. It is probable that the slit-lamp will help us to make a more exact and scientific classification; certain it is that the appearances suggest the existence of many distinct pathological states hitherto roughly grouped together under the comprehensive terms "superficial keratitis," "dystrophia corneae," or "bullous keratitis." On the other hand, some of the varieties labelled with definite names, such as "alphabet keratitis," prove not to be pathological entities. The essential point of distinction is situation. The slit-lamp with its accurate localization enables us to decide that the abnormal state is wholly superficial, external to Bowman's membrane; that it is located in the corneal stroma, but in its outermost lamellae; that it is fully interstitial; or that it is confined wholly to the deeper layers

of the cornea, perhaps affecting the endothelium alone. Fig. 4 is an example of a perfectly superficial keratitis, a case that caused me considerable anxiety till the slit-lamp examination showed that the whole process was external to Bowman's membrane.

Herpes ophthalmica may cause a characteristic lesion lying in the superficial layers of the stroma just inside Bowman's membrane. Fig. 6 shows the appearance of the cornea examined with loupe and the focal illumination of a half-watt lamp. The view with the Czapski microscope is seen in Fig. 5. The difference is striking and is a good example of the value of the slit-lamp. Fig. 7 portrays a late stage in a severe example of corneal inflammation in connexion with herpes ophthalmica. The whole surface of the cornea is covered with plate-like calcified deposits.

FIG. 4.—Keratitis epithelialis.



FIGS. 5 and 6.—Herpes of cornea.

Keratitis Disciformis.—Fig. 8 was drawn from a case at any rate simulating this disease. There was a history of a trivial accident to the cornea. The section (Fig. 8A) shows that there is a fibrosed disc situated superficially in the substantia propria and that the whole thickness of the cornea is vascularized. Here again the slit-lamp gave useful information, for examination with the loupe led to the erroneous conclusion that the vessels were in the main at any rate superficial.

FIG. 7.—Calcification of cornea after herpes.

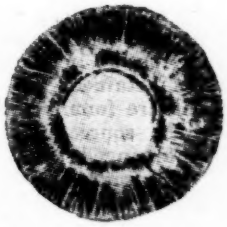


FIG. 8.—Discoid keratitis following injury.

FIG. 8A.—Fig. 8 seen in optical section.

Central Keratitis.—This affection, which is said to be tuberculous in nature, may leave permanent radial folding of Descemet's membrane and occasionally of Bowman's.

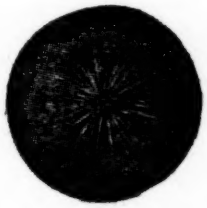


FIG. 9.—Radial folds of Descemet's membrane.

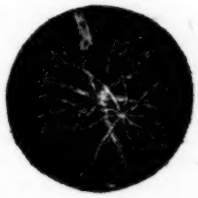


FIG. 10.—Folding of Bowman's and Descemet's membrane.

Fig. 9 shows folds of Descemet's membrane of the radial type, and Fig. 10 folds of both membranes.

Folding of Descemet's membrane can be seen with the slit-lamp in most inflammatory states of the anterior segment of the eye and are almost constant after operation upon the cornea. They are invariably present in interstitial keratitis. Typical examples are seen in Fig. 11. They followed a preliminary iridectomy. Two days later no trace of folding could be seen. We must make a distinction between true and false folds, the latter being in reality tears in the membrane.

Interstitial Keratitis.—A description of this disease as seen by the slit-lamp would demand a lecture to itself; I must therefore confine my remarks to two points alone. In a late case which we might regard as cured, leaving the usual rests or shades of a past vascularization visible with the loupe by oblique illumination, we may find that the vessels are not, as imagined, functionless and atrophied, but that they still carry an active blood stream—that the disease is in fact by no means at an end. Here again the slit-lamp gives us information not previously at our disposal. It is true that in many of these cases a correct use of loupe and illumination will permit us to see the flowing blood without using the slit-lamp, but there are others in which the vessels are so tenuous that the blood stream can be detected only with the Czapski microscope. When we examine the corneal prism in this type of case, a parenchymatous keratitis that has run its course, we note that it is quite difficult to get a clear sharp image of the epithelial surface, but that the endothelial is easy to see. This is due to the fact that the posterior surface of the cornea is sclerosed and reflects light better than the corneal surface. This appearance is quite characteristic of the disease.

FIG. 11.—Folds in Descemet's membrane after operation.

ANTERIOR CHAMBER.

The examination of the anterior chamber with the slit-lamp is of the very highest importance with reference to inflammatory states of the anterior segment of the eye. Keratic precipitates ("K.P.") can be detected when so small that they are apt to be overlooked by the older methods, and under high magnification much can be learned about their nature and significance. We are liable to regard flakes of absorbing cortex upon the surface of the cornea as "mutton-fat K.P." and to become unduly alarmed. Black K.P. is very common after operation involving the iris, and I regard it as perfectly harmless. It peppers the anterior surface of the iris and settles down upon the lower two-thirds of the cornea. After a perforating wound of an iris, and especially of a brown iris, the aqueous is full of particles of pigment which may be found for several days. The detection of floating particles in the aqueous is of supreme importance. We use the pin-hole, which forms the ribbon of the slit-lamp into a pencil. This beam illuminates the cornea and lens, but the anterior chamber should remain dark. If the aqueous is albuminous the beam becomes visible in the anterior chamber and the brightness of this beam is a measure of the turbidity of the aqueous. Figs. 12 and 13 show the beam passing across the normal and the turbid aqueous. If the aqueous contains formed particles these flash across the beam as scintillating specks. Their motion is due to convection currents in the aqueous caused by difference in temperature of the iris and cornea. The detection of cellular elements in the

FIG. 12.—Normal aqueous.

FIG. 13.—Albuminous aqueous.

FIG. 14.—Particles seen in beam across anterior chamber.

(Owing to the small size of the reproduction these particles are not well defined.)

aqueous may be the first sign of a sympathizing ophthalmitis and can give timely warning of this formidable condition (Fig. 14).

Iris.

The great advantage of the slit-lamp in the examination of the iris is that in addition to giving a highly magnified stereoscopic picture of the superficial area it enables us to illuminate from behind and see the iris in lens-light. If there is any atrophy of the retinal pigmentary layer or holes in this tissue the light shines through and the condition is made evident.

Lens.

The various forms of cataract can be localized and minutely examined with the slit-lamp and Czapski microscope. It is often possible as the result of this localization to decide at what period of life an opacity developed.

Each region of the lens is liable to its own type of cataract. Immediately under the capsule we find vacuoles and lamellar cleavage. The cortex shows cavities full of fluid (the so-called "fluid-clefts") and areas of degenerated fibres (myelin clumps). The central nuclei are liable in old age to sclerosis and to pigmentation. The anterior part becomes dark yellow, and, as we pass back, the yellow gives place to a burnt-sienna brown, which in cataracta nigra becomes almost black in the posterior part of the lens. The infantile and the embryonic nuclei are the seat of congenital cataracts and of lamellar cataracts. Many so classed are not really lamellar, but in the familial type affect the whole of the embryonic nucleus. Such a cataract seen in the beam of the slit-lamp looks like a lump of crystalline ice placed in the exact centre of the lens. In lamellar cataract we very frequently find that there is, in addition to the main central wreath of scintillating particles, one or more peripheral rings of condensed lens tissue, showing that the disturbance of nutrition has been periodic.

Capsular cataracts of varying types are common, and cannot be dated chronologically, for the capsule has covered each nucleus in turn. Many deep-seated axially placed cataracts may originally have had a subcapsular origin. As the capsule during the growth of the lens is constantly changing its situation with reference to the nuclei it leaves subcapsular opacities behind it. The lens sutures are apt to be the seat of opacities, and this is especially true of the primary embryonic sutures, the anterior and posterior "Y." Coronal cataract, or cataracta coerulea punctata, is generally regarded as a congenital type. This cannot be the case, for its situation is in the adult nucleus which has not developed at birth. I have myself observed this form of punctate cataract appear in a previously clear lens, and I have noted a rapid deterioration of sight. Cataracta coerulea is neither congenital nor is it stationary. It develops during adolescence.

The slit-lamp has furnished so much information regarding the anatomy and the pathology of the lens that all textbooks are obsolete in this connexion. From the operative standpoint the slit-lamp is indispensable, for it gives an accurate knowledge of the nature of the cataract that we propose to extract or needle, and allows us to detect the earliest signs of inflammation both before and after operation. I should not now dream of operating upon a cataract till I had made a minute examination with the Czapski microscope, and I have already refused to extract a lens that I should have operated upon had the slit-lamp not forewarned me of a chronic cyclitis. I was able to decide that one eye was fit for operation, the other undesirable.

Vitreous.

The appearances of the vitreous are varied and often very beautiful. It is hard to realize that a normal perfectly transparent vitreous is actually full of massive fibrils, of membranous films, and punctate opacities. It is difficult to separate the physiological from the pathological, and the faculty can be gained only by constant application and long experience. The appearance seen with the slit-lamp must be compared with what is detected with the ophthalmoscope with the loupe and condensing lens. It is not generally known that the vitreous structure can often be made out with such simple apparatus as a half-watt lamp, a loupe, and a condensing lens.

Retina.

The examination of the retina with the slit-lamp calls for special arrangements and a high degree of technical skill. It is necessary to use an arc lamp instead of the convenient nitra lamp; a contact-glass to abolish the corneal curvature; and either to employ a single tube microscope, or to hang the slit-lamp above the Czapski, so that the axis of the slit-lamp beam may make a very small angle with the axis of the microscope. I cannot regard this branch of the work as coming within the scope of ordinary clinical work, but upon occasions it may afford valuable information about an intraocular tumour. Those interested in the subject should read Koeppe's book.

In conclusion, there is in my mind no doubt of the value of the slit-lamp. I consider that one who has made himself master of the technique and has given enough time to the subject has raised himself to a plane of ophthalmology higher than he previously occupied.

III.—CHARLES B. GOULDEN, M.B., F.R.C.S.,

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The best result by focal illumination can be obtained only when the illuminating source is brought to a focus upon the object to be examined. The advantage of this is that we only illuminate what we wish to examine, excluding light which might fall upon surrounding structures: in other words, we have our object brilliantly illuminated and seen in contrast with surrounding structures, which are in the dark. The source of light must be uniform, strictly limited, with a high specific intensity, and a sharp image of this source must be obtained.

All these conditions are found in the slit-lamp. We use the slit-lamp with the source of light and the various focusing apparatus, arranged after what is called "the method of Vogt." The source of light, which is a small tungsten lamp, is placed a little behind the principal focus of the lens contained in the condensing chamber. By this means the filament of the lamp is brought to a focus upon the focusing lens. The slit, which is placed a small distance in front of the condensing lens, becomes uniformly filled with light and acts as the source of illumination. The beam of light, therefore, contains in it two systems: one, the image of the filament which is brought to a focus upon the focusing lens, and the other the light which is contained in the slit and which will be brought to a focus by the focusing lens in whatever position we choose.

I do not wish to speak this afternoon of the slit-lamp as used merely as a method of focal illumination, but of the behaviour of the cornea and lens as mirrors when the image of the slit is focused upon them or in their neighbourhood. The anterior surface of the cornea, and also its posterior surface, act as convex mirrors. The anterior surface of the lens also acts as a convex mirror, but its posterior surface acts as a concave mirror.

All mirrors show three methods of reflection. (1) Light reflected regularly will produce an image of a luminous source at the point where the rays meet. This may be either a real image or a virtual image—when the image appears to come from a point behind the mirror. Such an image will be seen only when the eye is placed in the path of the reflected rays. (2) Light is also reflected diffusely in the same way as light is reflected from any object that is visible to us: it is, in fact, the light reflected by the mirror, so that the mirror may be seen by anyone in the neighbourhood. (3) There is another method by which rays are reflected which gives rise to what is called specular reflection. You are all acquainted with the peculiar reflection made by a blackboard which prevents your seeing what is written upon it. This is an example of specular reflection.

The Reflecting Surface of the Eye.

Reflection will occur at each zone or discontinuity of surfaces where the index refracting suddenly alters. These are:

1. Anterior surface of the cornea.
2. Posterior surface of the cornea.
3. Anterior surface of the lens.
4. Anterior surface of the adult nucleus.
5. Anterior surface of the embryonic nucleus.
6. Posterior surface of the embryonic nucleus.
7. Posterior surface of the adult nucleus.
8. Posterior surface of the lens.

Diffuse Reflection.

As the beam of light passes through the various media of the eye it illuminates each surface as well as the substance of the medium itself. At each place where the beam strikes a surface a band of light is produced, owing to the peculiar ribbon shape of the beam. In this way circumscribed portions of surfaces and media are illuminated, and so become visible by diffuse reflected light to anyone in the neighbourhood.

Regular Reflection.

The more polished a surface, and the greater the difference between the refractive indices of the bounding media, the more light it reflects: the greater the angle of incidence, the greater the amount of light reflected. The least amount of light is reflected when the incidence is normal to the surface.

The Formation of Images and the Anterior Surface of the Cornea.

The cornea is a convex mirror having a radius of curvature of about 8 mm.; the principal focus is therefore 4 mm. behind it. We have three possible relations between the image of the slit and the cornea:

1. The surface of the cornea may be at the focus of the beam of light. In this condition the image of the slit coincides with the band of light which is formed by diffuse reflection.

2. The surface of the cornea may be situated in the post-focal part of the beam; the rays, therefore, when they strike the cornea, are divergent. The image of the slit is therefore formed behind the cornea between its apex and principal focus.

3. The surface of the cornea may be situated in the pre-focal part of the beam—that is, the cornea is cut by the ribbon of light before the rays have come to a focus. The image of the slit now depends upon the relation of the focus of the beam to the principal focus of the mirror.

(*a*) If the rays come to a focus between the apex of the cornea and its posterior focus, then the reflected image of the slit will be in front of the cornea.

(*b*) If the image of the slit is formed at the principal focus of the mirror, then the image formed by the cornea is at infinity.

(*c*) If the image of the slit is formed between the principal focus and centre of curvature of the cornea, the image formed by the cornea is behind the centre of curvature.

(*d*) If the image of the slit formed by the rays is at the centre of curvature of the mirror, here also will be the image formed by the cornea.

(*e*) If the image of the slit is formed behind the centre of curvature of the mirror, then the image formed by the cornea is between the centre of curvature of the cornea and its principal focus.

We have mentioned before that in the beam which leaves the slit there is also the image of the filament of the lamp which we focus upon the focusing lens. The image of the lens with the contained image of the filament will also be formed in the cornea. Now the focusing lens is always further from the cornea than is the image of the slit. The image of the focusing lens is consequently formed, and always lies, between the apex of the cornea and its posterior principal focus; for example, the condition in which the image of the slit is formed by the focusing lens between the apex of the cornea and the principal focus. The catoptric image of the image formed by the lens is therefore in front of the cornea. If now we focus a microscope gradually towards the cornea, we shall first note the catoptric image of the slit formed by the cornea; then, as we advance the microscope to the cornea, the band of light formed by diffuse reflection; and, as we focus still deeper, we shall encounter the image of the focusing lens with the contained image of the filament of the lamp and the band of light in the cornea. We shall also encounter in the band the specular reflection referred to previously; this is always smaller than the band of light in the cornea. Until Vogt pointed out the clinical use of specular reflection it was always considered to be a nuisance, and every attempt was made to avoid it. Certain things may, however, be seen in the area of specular reflection which cannot be seen by any other means: these are chiefly minute inequalities of the surface, such as changes in the superficial epithelium due to glaucoma and small irregularities of the epithelium.

Reflection from the Posterior Surface of the Cornea.

The reflection from the posterior surface of the cornea is not nearly so bright as that from its anterior surface, mainly due to the fact that there is a very small difference between the index of refraction of the cornea and the aqueous. The light reflected from the posterior surface of the cornea is yellowish; this is due to the fact that the light before it reaches the observer has to pass through the thickness of the substance of the cornea, where a good many of the rays of shorter wave-length are absorbed. So as to observe the light reflected from the posterior surface of the cornea we must have a large angle between the illuminating source and the normal to the cornea, and observations must be made at an equally large angle on the other side of the normal. It is chiefly the specular reflection which is of value. We are actually able to see, in a magnification of no more than twenty-four times, the endothelium of Descemet's membrane and certain changes that take place in it.

The Anterior Surface of the Lens.

The anterior surface of the lens acts as a convex mirror, and we shall have similar phenomena to those seen when the beam of light was focused upon the cornea. The anterior capsule of the lens is not perfectly smooth. The result is an appearance in specular reflection of a fine shagreen. Not only this, but there is also present a peculiar lustre due to the difference between the images seen by the observer in either eye with the binocular microscope. You will remember that pictures for use with the spectroscope, one of which is black and the other white, when fused together give a lustre very much like that of a surface polished with black lead.

The Posterior Surface of the Lens.

From the posterior surface of the lens the appearance of shagreen is also found in specular reflection, and Vogt has pointed out that in such diseases as retinitis pigmentosa there is a peculiar iridescence from the posterior surface of the lens before any actual opacity has occurred. It is an important clinical fact, and by it we are said to be able to distinguish a complicated cataract from a senile cataract. This peculiar iridescence may also be obtained from the capsule left after extraction of a senile cataract. From the surfaces of the adult and embryonic nuclei no similar phenomena can be observed. Apparently this is due to the very slight difference in the index of refraction between the various layers of the lens. We are, however, able to see various bands formed as the beam of light passes through the lens.

IV.—O. GAYER MORGAN, M.Ch., F.R.C.S.,

Assistant Ophthalmic Surgeon, Guy's Hospital; Ophthalmic Surgeon, Royal Westminster Ophthalmic Hospital.

For the purpose of this short paper I have collected a series of cases of cyclitis, and I am going to discuss certain points which have been noted from time to time. The cases chosen showed the usual features, the symptoms being mistiness of vision and the obvious signs in most cases—keratitis punctata and vitreous haze. Iritis in association with the cyclitis was a variable factor, being in some quite a marked feature and in some apparently absent. Of the 15 patients, 11 were women and 4 men. The Wassermann reaction was positive in 7 cases, negative in 5 cases, and not taken in 2 cases.

The first feature I wish to consider is the keratitis punctata. This could be seen with the loupe in 9 cases: it was found only with the slit-lamp in 4 cases, and was apparently absent in 2 cases. In these latter not only was there no gross keratitis punctata, but no trace even of the dust-like deposit could be seen on the endothelium, and the endothelium itself in the central area of the cornea showed none of the changes usually associated with ocular inflammation. I have no note in these cases as to whether the amount of pigment in the keratitis punctata varied with the amount of pigment in the uvea, but some recent cases have made me think that this is a true relationship, and that those eyes with much pigment, brown irides, and tigroid fundi show a darker type of keratitis punctata. The aqueous flare, when looked for with the precautions described by Mr. Graves, was present in nearly every case, and in most of them definite formed particles could be seen. It is a curious fact that these particles are almost invariably seen moving upwards, and that, although they must all move downwards in the convection currents, it is the rarest thing to see this happen in the aqueous beam. The flare is best seen with the smallest cylindrical beam of light, whereas the particles are most obvious when the slit is fully open and a large beam is used. The presence of deposit on the anterior lens capsule seems to have no relationship with that on the endothelium covering Descemet's membrane. As a rule it seems to avoid the anterior lens capsule, and this may be due to the influence of the convection currents in some way or to changes in the endothelium which predispose to deposition there. There are exceptional cases where it is more thickly scattered on the lens and iris than on the endothelium, and in these cases it is noticeable that the iritis is a more dominant factor.

In most of the cases subcapsular vacuoles could be seen. They are often more easily spotted with the electric ophthalmoscope than with the slit-lamp, as the field of observation is so much larger, and they are easily missed with the small beam of the slit-lamp. When their position has been noted with the former method they can then be found and studied with the corneal microscope. They are like very bright spheres of varying size on the surface of the lens, and throw a shadow into the lens when illuminated from in front. They may easily be missed with the ophthalmoscope when the vitreous is very cloudy and the brightness of the red reflex dimmed in consequence.

In five cases definite iridescence of the posterior capsule was visible in the reflecting zone. This indicates that the usual mirror-like reflex from this surface has been changed by some roughening or thickening in the capsular area, causing some interference with the normal action of the beam of light. The iridescence, except in one case, was present without there being anything in the nature of a posterior cortical opacity secondary to the inflammatory condition which could be seen with the ophthalmoscope or the slit-lamp. In the one exception there was a typical secondary cataract in the neighbourhood of the posterior lens sutures with very brilliant iridescence. This iridescence seems to last a very considerable time, because in two cases with positive Wassermann reactions, in which the condition has improved under treatment and the vision is now 6/6, it can still be very easily seen. In both these cases, however, there is still a very marked though extremely fine vitreous haze visible with the ophthalmoscope. The changes producing this iridescence must be extremely fine to cause such a minimal interference with the visual acuity.

Behind the lens is the retrolental space, which normally is optically empty. Usually in cases of cyclitis this space remains optically empty, although the vitreous may be densely packed with deposits. This is not constant, however, and occasionally one sees formed particles which seem to move in this space.

Bounding the retrolental space behind is the anterior curtain of the vitreous. It lies in folds, which in some places hang vertically and in others look more like a meshwork of vertical and horizontal strands. Normally it floats up and down with movements of the head, and if it is attached somewhere in the ciliary region it certainly has a considerable amount of slack. If the anterior layers of this curtain represent the hyaloid, then this latter is not the tightly stretched membrane one has usually been led to consider it. With the patient in the upright position the curtain is seen, on movement of the eye, to float downwards until it is drawn taut by its attachment above. It is probable that there is an attachment all round in the ciliary region, and that if the eye is examined with the patient in the reverse position this attachment would be demonstrated. It would be interesting to examine the eye with the patient in the prone position to investigate the retrolental space, but this is not yet possible with the present instrument. In one case this anterior curtain could be seen to be definitely attached to the posterior surface of the lens, so forming a loculation, as it were, of the retrolental space. The rest of the curtain moved freely, pivoting on this attached point. I presume that this vitreous synechia may be considered as analogous with the iris synechia and be possibly of inflammatory origin. The meshwork of the vitreous in these cases of cyclitis contained a very much larger proportion of formed particles, mostly pigmented granules, than normal. I had a feeling that in those specific cases the particles were much finer and more uniform in size than in those with a different etiology and in which some septic focus was responsible for the condition, but Mr. Graves tells me that the largest opacities he ever saw were in a case of congenital syphilis. It is difficult to say how long it takes for the vitreous to become quite clear of these pathological particles. In the two cases I have mentioned before, where vision is now 6/6 and has been so for some months, and where the actual condition is presumably cured after a full course of N.A.B. + mercury, the vitreous is still densely packed and the haze is quite visible with the ophthalmoscope.

GENERAL DISCUSSION.

Mr. Humphrey Neame (London), for his contribution to this discussion of slit-lamp microscopy, took the description of a case in which detailed examination had been much facilitated by the use of this special apparatus. The particular interest of the case was that the termination was not of a particularly common type. The case was one of posterior stellate or rosette opacity of the lens following trauma, in which the opacity disappeared completely in the course of a few weeks.

Hudson, in a "Clinical study of posterior traumatic cataract" (*Royal London Ophthalmic Hospital Reports*, xviii, 112), had described forty-three cases of different types of such opacity, in the course of the development of which, from a short time after the receipt of the injury, he traced the following appearances in the more typical cases in the order of their occurrence: (1) Feathery striae in connexion with the lines of the lens star; (2) vacuoles in the mid-ribs of the feather-like opacities; (3) lacework replacing the feather-like structure; (4) vacuole formation, particularly towards the equatorial region, often in palisade formation parallel with the lens fibres; (5) breaking up of the opacity into discrete vacuoles, which gradually became smaller until only a few granules of opacity remained.

Hudson believed the opacity to be due to swelling of the lens fibres of the posterior layers, and produced a number of arguments in support of this; also that it had no connexion with aqueous action, for it occurred equally with penetrating and with non-penetrating injuries.

In Hudson's series only two cases out of the forty-three had resulted in complete disappearance of the opacity; in one of these the lens was completely clear three months after a penetrating wound of the cornea, without penetration of the lens and without retention of a foreign body in the eye (*x*-ray evidence and magnet negative); in the other there had been a small scleral wound with the presence of a foreign body in the vitreous, but without penetration of the lens. The foreign body was metallic and was removed by magnet eleven days after injury. The opacity had disappeared eleven days after operation. In the former the opacity was composed of irregular vacuoles, in the latter it was a small posterior-discoid opacity. In fifteen cases general opacity of the lens subsequently developed, and in the others variable degrees and types of posterior opacity persisted.

M. H. Whiting, in his description of concussion changes in the crystalline lens (*Trans. Ophth. Soc.*, xxxvi, 1916, 169), had included in his posterior cortical cataract cases

seven of stellate variety. These were the result of war injuries, and were only under observation for short periods, so that, from the point of view of absorption of opacity, they are of less value. Of the seven posterior stellate cataracts, one was in part absorbed in thirty-eight days from date of first observation (within two or three days of injury), and one was lessened in ten days. Both of these were concussion injuries only. The others, during short observation, remained stationary or increased in density.

Vogt (*Atlas of Slit-lamp Microscopy*, Berlin, 1921, p. 80, and Fig. 202b) had described and illustrated a typical posterior rosette-shaped subcapsular cataract in a patient in whom the cornea, iris, lens, and vitreous had been penetrated by a needle. It was present within thirty-six hours of the time of injury, and then measured 4.5 mm. in diameter. In ten days it had diminished to 2 mm. diameter, in twenty days to 1 mm. diameter, and in six weeks was represented merely by a few dots of opacity, at which date V=6/6. Vogt described the opacity as composed of minute droplets under the posterior capsule and also between the posterior lens fibres, as in the opaque area the suture and lens fibre pattern were strongly delineated.

Mr. Neame's case was a patient at the Royal London Ophthalmic Hospital, under the care of Mr. Juler, to whom he was indebted for permission to report the condition. John H., aged about 40, was injured in the left eye by a fragment of metal on April 26th, 1924. The cornea and iris were perforated, but no fragment of metal was retained in the eye. Seven days after the date of injury Mr. Neame made the drawing of the cataract—a typical feather-like posterior stellate opacity—under examination by slit-lamp microscopy. The opacity had been reported two days earlier by the house-surgeon—that is, five days after injury; it was of an almost completely symmetrical eight-pointed star shape, very similar to the one shown by Vogt. The opacity was not measured, but occupied a decidedly longer transverse diameter than that of the widely dilated pupil, for the apices of the arms were barely visible by examination with the microscope in an oblique direction behind the iris. The drawing shown therefore represented the composite appearance of the opacity as examined obliquely in every direction, and not as seen directly antero-posteriorly through the pupil. Under higher magnification (obj. A.2 and E.P.2= ×24 diameters) of the edge near one point the opacity was seen to be composed of elongated ovoid portions resembling those described by Hudson—like the juice-sacs in fruit such as an orange. It seemed to Mr. Neame probable that the appearance was due to irregular swelling of the lens fibres, as suggested by Hudson, and not to vacuole formation between them.

Seventy-one days after the above observation was made there was no trace whatever of lens opacity, only a somewhat increased brilliance of the posterior reflecting zone of the lens, beyond which the vitreous was visible. Left vision +3.0 sph.=6/12 partly.

Mr. BASIL GRAVES, in reply to the criticism that the path of the beam could not be seen in the normal aqueous fluid, remarked that the path of the beam in the normal aqueous fluid was clearly visible if the precautions advocated were taken. With the arc-lamp it was evident to a novice. When the more ordinary nitra-lamp was used it was essential that the resistance should be regulated so that the filament was burnt at its brightest intensity and the dark-room should have no leakages of light. It was not correct to say that a long period was required for the observer's dark adaptation: the speaker had found that a few seconds were always enough. He thought that ability to recognize the visibility of the beam in the normal aqueous fluid was important in the sense that notes on a case affirming an aqueous fluid to be normal were of greater clinical value if made by an observer who was able to see the beam in the normal aqueous fluid than if made by one who was not so trained. It was much the same, for example, as the relative value of notes which affirmed that a fundus-macula was normal when the observer who made them knew that he had really seen and recognized that macula as compared, on the other hand, with the value of a similar statement made by an observer who, having vaguely seen the region where he supposed that macula to be, said that the unseen macula was normal because he saw there nothing obviously pathological. In the earlier notes of Mr. Graves, taken two to three years ago, which were the subject of a research report he was now making, he regarded the frequent statement in them as to the aqueous fluid being normal of little value, save to indicate that it was not grossly abnormal, because he had not then learnt a sufficiently delicate method for its observation. On the other hand, he knew that if in more recent times his notes on cases stated that the aqueous fluid was normal, he could depend upon that statement, because he would not have said so without having made a point of arranging the apparatus with sufficient accuracy to have seen the beam in that normal aqueous fluid.

As regards the question of the vitreous, a review of notes made on many cases over a long period was showing him that it was very difficult to draw conclusions about its pathological changes which enabled a classification of clinical conditions to be made, fitting in with preconceived notions of clinical types. From a purely practical point of view the clinical usefulness of the slit-lamp examination of the vitreous in no sense came up to that of the simple but valuable method of inspection for pathological vitreous "dust" by means of the direct electric ophthalmoscope when this instrument was properly used.

Mr. HARRISON BUTLER, in reply, said he had not hitherto succeeded in seeing the flare in the normal aqueous. (This discrepancy was cleared up in the afternoon at the demonstration of the slit-lamp. When the lamps were used at the normal voltage (8 volts) the flare was not visible even to Mr. Graves, but when the current was boosted up and the lamp overrun the flare was distinctly seen.) It would therefore appear that the visibility was a function of the illumination, and this might be regarded as a test of normality. If the flare was easily seen at a voltage of eight, the aqueous was probably abnormal. The slit-lamp distinctly showed a hyaloid membrane. He had obtained a mirror effect from the hyaloid membrane, and on it he had been able to make out a marbling of the surface. He did not wish to dogmatize, but he thought that the appearances showed that there was a real retrolental space between the lens and the hyaloid, which were optically inactive. The vitreous fibrils were, he thought, attached to the hyaloid membrane and normally did not reach the lens. Under pathological conditions the fibrils might be attached to the lens.

He agreed with Mr. Graves that it was very difficult to interpret the appearances seen in the vitreous, and that such must be checked by careful examination with the ophthalmoscope. He regarded fine particles as abnormal; in fact, the coarser the vitreous architecture the more it approached the normal.

SYMPATHETIC OPHTHALMIA AND ALLIED CONDITIONS.

BY

JAMES ALEXANDER WILSON, O.B.E., M.D.,
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THE etiology of sympathetic ophthalmia remains an interesting problem. The inquisitive mind finds in the evolution of medical knowledge an ever-changing outlook on this and other problems; the collecting of evidence, the expression of opinion, and the clash of criticism are all necessary if we are to make satisfactory progress towards our ultimate goal —the prevention of disease and the maintenance of health.

In an article on sympathetic ophthalmia[1] published some years ago, I asked the question: How is disease of a particular type transferred from one eyeball to the other? In the conclusion it was suggested that:

> In sympathetic ophthalmia—as in tetanus—toxins pass up the nerve and reach nerve cells, causing a central disturbance, with efferent influences—as in herpes—which manifest themselves first as capillary changes and then as uveitis.

This problem may now merit further brief consideration. Speaking in a general way, when a soluble toxin is carried in the blood stream, the distribution and manifestations are likely to be "symmetrical"; when there is a microbic virus the distribution and manifestations are likely to be "asymmetrical."

Disease of the anterior part of the eyeball is usually due to some noxa, circulating in the blood stream, that acts directly on the tissues. It may be the virus of specific disease, infective material from any part of the body, metabolic or chemical toxins, but it is a noxa that is diffused generally. Certain factors may operate to determine a secondary infection or precipitation and its locality: such as trauma—surgical or accidental—local secretion, affinity, local overwork, and possibly the influence of the sympathetic nervous system.[2] In sympathetic ophthalmia the disease in the first or injured eye is probably in most cases autogenous, with trauma as its determining factor. On the other hand, ordinary herpes is a peripheral manifestation of a central nervous disturbance.

Messrs. Orr and Rows, in their paper[3] dealing with the infection of the nervous system via the lymphatics of the peripheral nerves, showed that where there is an infective focus there is usually an infected lymph stream ascending from it to the central nervous system—a current that lies in the perineural sheaths. In a recent paper by Marinesco[4] there is a record of experimental research on the virus of herpes febrilis. This virus was inoculated into the corneo-scleral margin of a rabbit's eye; it produced kerato-conjunctivitis and, later, serious general symptoms. After death it was found that the virus had left a track of its passage to the brain. There was lymphocytic infiltration in the choroid, ciliary nerves, ciliary ganglion, Gasserian ganglion, and on into the brain. The retina, sclerotic, optic nerve, the motor root of the ciliary ganglion, and the common oculo-motor nerves were all practically left intact. This is the path of an invisible or filter-passing virus. Sympathetic ophthalmia is by some writers also thought to be due to a filter-passing virus, but one that makes its way into the blood stream, survives the hostile defensive agencies there, and then, owing to some peculiar affinity, settles in the uninjured eye.

In tetanus and diphtheria the virus enters the nerve terminals at the infecting focus in the skin, tissues, or mucous membrane, and ascends in the perineural lymph spaces, so reaching the corresponding basal nucleus or root ganglion. In a case of localized tetanus due to the presence of a piece of metal near the brachial plexus it was the shoulder muscles of the same side that manifested tonic spasms. In another case a wounded foot was associated with tonic spasms of the corresponding thigh muscles and later with those of the other thigh. In diphtheria the palate frequently becomes paralysed. In these cases the conclusion is that the manifestations are limited by or "correspond to the nerve supply." Here the invading infective material is not diffused generally or mainly, but is confined: it is compartmental or segmental. Perhaps there are here the elements of a pathological arc—that is, the receptor, the nerve cell, and the effector segment.

The fifth nerve is the sensory or afferent nerve for the eyeballs, eyelids, nose, sinuses, gums, teeth, tonsils, skin of forehead, and face. The three divisions converge to and enter the Gasserian ganglion. This ganglion receiving many ascending streams may thereby have its functions influenced by various noxae and possibly in various ways. An interesting and suggestive syndrome is seen in a case presenting trigeminal neuralgia, herpes ophthalmicus, and paralysis of the sixth nerve, and in another presenting the same manifestations with the addition of uveitis and anaesthesia of the skin or cornea. The neuralgia and the anaesthesia indicate involvement of the Gasserian ganglion, but the paralysis of the sixth nerve indicates that the central lesion has extended to the sixth nucleus. Irritation of the fifth nerve may produce a variety of manifestations, that of the sixth nerve is probably limited. Occasionally in these cases we also get vesicles on the cornea, and the pain that they cause reminds us that the locality selected is one that has a rich supply of afferent nerves. The vesicles on the forehead and cornea and the uveitis are all due to the same primary noxa. How are these peripheral manifestations produced? Are we to believe that they are due to a noxa manifesting merely contemporaneous chemical affinity for central and for various peripheral structures; that the central and peripheral lesions are isolated and independent; or are we to believe that efferent or antidromic impulses pass along afferent nerves, impulses capable of producing—as Dr. Ivy McKenzie maintains—dilatation of capillaries and inflammation? These peripheral manifestations are one-sided, and are limited in area by nerve distribution. Further, they are associated with neuralgia, anaesthesia, and paralysis, conditions that are dependent on the central lesion.

I recently saw two patients with the sequelae of encephalitis lethargica. These patients were under the care of Dr. John Rowan, but I have his permission to refer to them. Both had paralysis of nearly all the eye muscles on one side with ptosis and dilatation of the pupil. One had small bullae on the cornea, and the other keratitis with ulceration of the cornea and later inflammation of the eyeball. Here again there is a central lesion, paralysis of muscles, and peripheral conditions resembling herpes.

Ordinary bullous keratitis may be associated with anaesthesia of the cornea and conjunctiva, an association that suggests a central or nerve origin, probably a neuro-toxic condition. In herpes ophthalmicus we occasionally get symptoms of sympathetic irritation in the other eye: still sympathetic ophthalmia remains a somewhat unique disease, associated with a unique arrangement of the optic nerves. The whole neuro-optical apparatus possesses much structural and functional unity.

Experiment[5] has demonstrated that when aseptic particles of a choroid, taken from a human case of sympathetic ophthalmia, were implanted into the eye of a monkey, paths of infection were afterwards found leading along the sheath of the optic nerve, "or first along the anterior ciliary vessels out of the eyeball, then along the external eye muscles, and again backwards to the vaginal tissues," or to the optic nerve high up. All the affected animals showed changes in the coverings of the optic nerves, and three out of four developed meningitis. In this way, even if the optic nerve had been cut (Fuchs), the noxa could still pass up the optic nerve and reach both sides of the brain.

If there is an efferent influence, then, in herpes ophthalmicus it travels by the frontal and nasal branches of the ophthalmic division, and in sympathetic ophthalmia perhaps by the nasal branch to the ciliary ganglion or perhaps by some other channel. These various allied conditions suggest a mechanism that is largely limited by nerve distribution. The direct action of a diffused noxa calls for general treatment, and when a central or neuro-toxic element is present this also calls for treatment, sometimes even more so than the local eye condition. We have still occasionally to remind ourselves that the eye is an item in a commonwealth and not an isolated entity calling only for individual consideration.

References.

[1] Wilson: *Glasgow Medical Journal*, April, 1918. [2] Orr and Sturrock: British Medical Journal, June 3rd, 1922, p. 877. [3] Orr and Rows: *Brain*, Vol. XXXVI, Parts III and IV, 1914. [4] Marinesco: *Annals de l'Institut Pasteur*, Aout, 1923. [5] Deutschmann, F.: *Ophthalmoscope*, January, 1911, p. 864.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A COMPLICATED CASE OF FRACTURE AT THE BASE OF THE SKULL.

The following case, which presents some unusual features, was treated by me recently at the Beckett Hospital and Dispensary, Barnsley, Yorkshire.

A well developed man, aged about 30, was thrown from his bicycle during a collision. On admission he was bleeding slightly from the right ear; there were no marks of external violence; he was very drowsy, but could easily be awakened and could answer questions. A diagnosis of fractured base and concussion was made. On the following day he was completely unconscious; there was slight inequality of the pupils with a right-sided hemiplegia, and on careful examination a faint bruise could be seen over the right mastoid process. The temperature was now 100° F.

Operation.—On the right side of the skull a flap corresponding roughly to the outline of the squamous portion of the temporal bone was turned down. A fracture was now observed passing across the mastoid process and apparently extending across the middle cranial fossa. A trephine opening was made just over the external auditory meatus, and enlarged with forceps. The dura mater was dark blue in colour, bulged through the aperture, and

was without pulsation. A cruciform incision was made in the dura mater, and several large blood clots with a quantity of softened brain matter escaped. The scalp was then sutured, the wound being closed without drainage. The patient had completely regained consciousness at the end of twenty-four hours after the operation.

I have to acknowledge the skilled assistance of Dr. E. Orsmond during the operation.

Poona, India. J. DESMOND O'NEILL, M.B., I.M.S.

OVARIAN CYST COMPLICATING A SIX AND A HALF MONTHS' PREGNANCY.

THE case here recorded is of interest partly on account of the longer duration of pregnancy than usual, and partly because the strangulation of the cyst pedicle gave rise to practically no symptoms, there being no pain and only a slight rise of temperature to give warning of the event.

A woman, aged 18, was admitted to the Government Hospital, Apia, Samoa, on June 26th, 1924. She was six months pregnant and had noticed a tumour on the right side of the abdomen, in addition to the uterus. The day before admission she had acute abdominal pain and thought she was about to miscarry. She had noticed the tumour for over two months, and also that it enlarged more rapidly than the uterus. She had no pain until just before admission and the bladder had given no trouble, though the bowels were somewhat constipated. She had one child (18 months old), the delivery having been normal.

The pregnant uterus occupied the lower half of the abdomen, there being a decided list to the left, with a prominence extending upward towards the splenic area. A tense fluctuating swelling occupied the right side of the abdomen, arising apparently from below and behind the right upper margin of the uterus and extending up to and bulging the right lower ribs. This tumour was quite distinct from the uterus and was dull on percussion, with a marked fluid thrill. Vaginal examination revealed a soft patulous os, but no sign of commencing labour. Nothing was to be felt in the right fornix, which was higher than the left, the gravid uterus being palpable through the latter. By June 28th all pain had ceased, but began again on July 2nd, and early on July 3rd a live 6½ months foetus was spontaneously delivered; it survived for about half an hour. The puerperium was normal until July 5th, when the temperature rose to 100.4° F.; it fell below normal on July 6th.

On July 7th abdominal section was performed, and a large dark brown cyst was found extending right up to the liver, which was displaced upwards and backwards. The cyst was adherent in places to the liver, omentum, and parietal peritoneum, the latter being inflamed all over and covered with serum and recent fibrin tags. The pedicle was strangulated, being twisted two and a half times on itself, and arose from the position of the right ovary. The cyst contained port-wine coloured fluid. The temperature rose after the operation, reaching 103.4° F. on July 10th; it then fell to normal and remained so. There was a decided flow of bright-coloured lochia for three days after the operation.

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MULTIPLE ABNORMALITIES IN THE INGUINAL CANAL AND TUNICA VAGINALIS.

SEVERAL years ago a man on active service in France complained of a "strain in the right groin." No definite diagnosis was made by the regimental medical officer. Since then, on several occasions, he has experienced a sudden drawing up of the testicle accompanied by pain. After a recent attack of this kind, unattended by nausea or vomiting, the right testicle and cord were found to be swollen, tender, and drawn up to the external ring. In a hot bath, after gentle downward stroking, the testicle and cord regained their normal position, but further examination revealed the presence of a thickened cord and bubonocele.

At the ensuing operation the following abnormalities were found. The upper end of the tunica vaginalis lay on the anterior surface of the external oblique muscle and over the external ring. The cord was completely twisted five times on itself. After it had been untwisted a large pampiniform plexus of veins was disclosed which hung like a septum into the tunica vaginalis. When this plexus had been removed, together with the surplus tunica vaginalis, a hernial sac was opened at the upper end of the inguinal canal and was found to contain a mobile caecum, with the appendix adherent to the wall of the sac. These various conditions were dealt with in the classical manner.

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Reports of Societies.

COCAINE ADDICTION.

AT a meeting of the Society for the Study of Inebriety on October 14th, Sir WILLIAM WILLCOX presiding, a discussion on cocaine addiction was opened by Professor W. E. Dixon, M.D., F.R.S., Reader in Pharmacology in the University of Cambridge.

Professor DIXON said that coca leaves had been used from time immemorial by the Indians in the west of South America as a stimulant and narcotic, and the habit survived to the present day, especially in Peru. It was asserted that natives who chewed the coca leaf were able to perform long and rapid journeys with less fatigue and without feeling the pangs of hunger. On two occasions in the past the speaker had had injected into himself, intramuscularly, by way of experiment, about 1½ grains of cocaine. The effects gave no pleasure at the time, and left none as a memory, but each injection produced a frontal headache, some little excitement, increased reflexes, dilated pupils, and pronounced insomnia. His experience in this respect did not differ greatly from that of many others. It might well be that cocaine did not represent the whole action of fresh coca leaves. It was probable that coca-chewing allayed the pangs of hunger, which were in some way associated with the alimentary canal, by depressing afferent nerve-endings.

The action of cocaine upon the nervous system corresponded with the stimulation of the whole cerebral cortex. After its injection into animals the cortex was more readily excited by electrical currents, whilst when injected into normal animals convulsions were produced which could, however, be prevented by first severing the crura. Moreover, there was a relationship between the amount necessary to produce convulsions and the degree of development of the cerebral hemispheres. Thus the dose of cocaine, per kilo of body weight, required to produce convulsions in the rabbit was 0.18, in the bird 0.06, in the dog 0.08, and in the ape 0.018 grains. It was not necessary to offer detailed evidence to prove that the symptoms in man were due to true stimulation. Other drugs were known to exert a somewhat similar action, but they were, happily, now no longer used to produce artificial exultation. Liveliness and exultation were sometimes seen after the injection of atropine, but the latter would never become a drug of addiction because of its extremely unpleasant actions otherwise. The same was true of caffeine, the stimulation from which was mild and prolonged.

With regard to cocaine poisoning, a quarter of a grain produced very little effect on an ordinary person, whilst 1½ grains was generally, though not always, well tolerated. The total dose varied from 8 to 23 grains, and there was probably not a case on record where cocaine had been used as a murder drug. However, cocaine, like other drugs which especially excited the central nervous system, was uncertain in its central action and varied greatly in different individuals; but when death resulted it was, he believed, always brought about by shock caused by sudden paralysis of the central nervous system. Mild stimulation of the latter, whether by direct or reflex stimulation, was followed by all the symptoms of cerebral hyper-activity, but if the stimulus exceeded a certain degree the exactly opposite effects were produced. He did not think that had been properly appreciated as the cause of collapse and death which sometimes followed the accidental but sudden absorption of cocaine in a susceptible person. In every case of death in man from the use of cocaine or other local anaesthetic the symptoms were strikingly similar to those produced in animals. The history of mishaps under local anaesthetics always showed that the poisonous action followed almost immediately after injection. If one-tenth of a grain of cocaine was injected into the hind limb of a rabbit death occurred in a few minutes, but if a tourniquet was placed round the leg after injection and kept there for half an hour toxic symptoms were either very slight or did not occur at all. Adrenaline was used in solutions for the

purpose of delaying absorption, and he thought the principle a good one, although it had to be remembered that if absorption occurred the adrenaline considerably increased the toxicity of the cocaine. Much had been written about idiosyncrasy, and it was undoubtedly a fact to remember that cocaine was far more dangerous in concentrated than in dilute solutions. When concentrated there was apt to be absorption into the circulation, whilst if dilute the conditions favoured adsorption to the tissue colloids which rendered the alkaloid innocuous. It was well recognized that man became tolerant to cocaine. With a little practice the dose might be increased as much as 20 grains. The explanation might be, as in the case of morphine, that it was due to increased destruction of the alkaloid, but that suggestion had never been proved. The ordinary laboratory animals did not become less sensitive to regular periodical doses of cocaine, but more so. So far as the question of tolerance was concerned, man therefore occupied a peculiar position in connexion with cocaine.

Turning to the question of addiction to cocaine, Professor Dixon reviewed the position in connexion with the drug prior to the war. It was sometimes said that the addiction epidemic in America, which was such an outstanding social problem there, started after the war or after the prohibition law; but that was not so, for the habit had been steadily growing for a number of years, though post-war conditions probably augmented the numbers. The Congressional Commission in America had stated, in 1919, that 2 per cent. of the whole American people, or 4 per cent. of the adults, indulged in narcotics. Cocaine-taking had spread over the world, but the habit was less prevalent in Europe than in the East or America. In Germany cocaine sniffing was entirely a post-war habit, and confined to the large cities, especially Berlin. In France the habit had been common during the latter years of the war, and had spread from there to Italy, Spain, and England. There was, however, reason to believe that drug addiction was diminishing in France. He had had opportunities of obtaining the powder sold by the habitués of the cafés and music halls in Paris, and each packet contained approximately half a grain of cocaine. It had been too frequently assumed that anyone using the powders was an addict. When cocaine addiction occurred as a single condition it was almost invariably the result of imitation and opportunity; it could be safely said that since the war addiction to cocaine had not followed the physician's prescription. The users of cocaine being a menace to others as well as to themselves, the problem became that of a State menace, and cases should be treated as typhoid and diphtheria cases were, not by making the patient responsible, as the "narcotic police" of New York would have them, but by isolation and effectual removal of the source of infection. The cocaine habit, when once formed, was the worst of all drug habits in that it more rapidly led to the mental, moral, and physical degeneration of the patient than the depressing drugs of addiction. Unlike morphine, cocaine induced insomnia, loss of appetite, dyspepsia, diarrhoea, and, not infrequently, delusions and deafness. In the one hallucination quite diagnostic of cocaine the patient complained of feeling some foreign body under the skin—sometimes like grains of sand; sometimes like worms moving. So far as he was aware that curious symptom was found in no other condition, but was pathognomonic of cocaine poisoning.

Although cocaine so rapidly led to degeneration in uncomplicated cases, nevertheless the prognosis was better than in the morphinist. The degree of addiction might best be gauged by the withdrawal symptoms. They were certainly the most severe with heroin, less with morphine, and least of all with cocaine. Even when doses of 30 grains were taken daily cocaine could be dropped at once without serious injury to the patient, whilst similar sudden withdrawal in the case of heroin would certainly jeopardize a man's life. The normal person derived no pleasure from injections of cocaine, though that did not mean that with practice the satisfaction would not come. Who, then, were the people likely to be affected and to derive pleasure from such a practice? In 1906 Sir Clifford Allbutt and he had defined such people as neurotics. Quickness and sensibility, acute perception, and alert muscular reaction were not morbid characteristics, but qualities of high breeding. Such qualities became morbid when developed in relative excess in the lower ranges of sensibility. The higher qualities remaining at their former mean, the controlling centres no longer held the lower centres in check. The ordinary troubles of life became exaggerated out of all importance, but when they took drugs of addiction such people became in a sense more normal. Thus addiction to drugs was very likely to occur in favourable conditions in that type of person, though unlikely to occur in the normal type. Therefore the drug habit, treated broadly, was not a disease but rather a symptom of a pre-existing mental condition. Where it was a disease—an accidental condition to a normal person—it ought to be readily curable, especially in the early cases, but that was not the case, though it was recognized that those who contracted the habit as a result of disease—the relatively normal people—were by far the easier to cure. Americans were now discussing whether drug addiction was a medical issue or a police problem, and the special police commissioner in charge of the narcotic division of the New York police, writing in the *Journal of the American Medical Association* this year, concluded that because addiction had its origin in or was coupled with crime or criminal environment in 98 per cent. of the police cases, therefore the problem was in the category of criminology and came within the province of the police. That savoured of the mediaeval method of dealing with lunatics. Drug addicts, in fact, made poor criminals, for judgement, self-control, and will power were lacking. The speaker added that each case of addiction presented a problem by itself, requiring the determination of the underlying cause. Few addicts came willingly for treatment so long as supplies of the drug were available, but fortunately supplies of cocaine were obtained only with difficulty here. He thought the following propositions would meet with few objections: (1) that the prosecution of cocaine traffickers should be carried out by every means at the disposal of society; (2) that some form of international control to prevent illicit importation of cocaine and coca leaves should be established, and here it was of happy augury that the League of Nations had instituted a committee of inquiry; (3) that it was desirable that cocaine should be controlled at the seat of production; (4) that information as to the gravity and danger of narcotics should be spread, not only among medical men and students, but especially among members of the teaching profession.

Discussion.

Dr. H. H. Dale expressed his appreciation of the paper, and said that he had been particularly interested in Professor Dixon's description of his own experience of the effects of cocaine. If he had understood him aright, he had experienced nothing which could be called pleasurable, and he had suggested that possibly there was something in the coca leaf which caused the pleasurable sensation said to have been obtained in the instances cited from South America, and that cocaine was not equivalent to the coca leaf in respect to the euphoria the latter was reputed to produce. The speaker did not quite follow him there. Had Professor Dixon considered the possibility that the circumstances of the experiment modified the expected results? From the investigations which had been made on drug addiction it appeared that cocaine addiction differed from others, particularly from morphine addiction, in being essentially the result of a social habit. He was told that the secret cocaine-taker was so rare as to be almost non-existent. In other words, the vast majority of cocaine-takers acquired the habit in night clubs and other convivial resorts, using it to stimulate their flagging sensations so that they might renew the hectic pleasures which were beginning to pall. But when Professor Dixon sat down in the lugubrious surroundings of a scientific laboratory, with no convivial companions to promote his hilarity, the speaker did not think he should expect cocaine to produce the pleasurable sensations which people experienced who took it in a different environment. He found it produced insomnia, but, after

all, insomnia was one of the things which the night-club habitué went to the night club to obtain; such a person wanted to whip up his brain so as to last out for a longer period. In this respect he imagined that cocaine addicts could be rather sharply differentiated from morphine addicts; the latter took their drug for the relief of pain or some other distress, and not that they might take part in night-club "enjoyments." He believed that cocaine addiction was practically limited to large cities; it had always been a city vice.

Dr. A. J. COPELAND gave an account of some work which he had been doing in Professor Dixon's laboratory on the action of cocaine substitutes on the central nervous system of animals.[1] He had compared particularly butyn, tutocain, novocaine, and psicaine—the latest introduction—in their production of convulsions in laboratory animals when given in small doses. The convulsions to which they gave rise were identical in character, though not in degree, with those caused by cocaine itself. Butyn in these experiments appeared to have twice the convulsive action of cocaine; tutocain approximately half, novocain about one-sixth, and psicaine rather less than cocaine. He submitted that these effects gave a valid criterion by which one might judge of the effects of these substitutes in man. Butyn certainly was capable of giving rise to severe epileptiform convulsions in man. He had had a personal experience with tutocain, though he believed that Dr. Dale considered it merely a subjective observation. He was using a concentrated solution and observing the effect on the nasal mucous membrane when suddenly he received a mental shock, became excited and restless, and thought he was going to have a convulsion. The effect was very definite, it passed off after a few minutes, and was succeeded by a pleasant exhilaration. He suggested that the properties of these cocaine substitutes might render them liable to be used for their stimulating action, and if that use was continued they might become drugs of addiction. He believed it was a fact that heroin was on the market for ten years before any case of heroin addiction was recorded; therefore the statements that butyn was not a drug of addiction must be taken with some reserve.

Dr. HARRY CAMPBELL read a letter he had received from Dr. Francis Hare, medical superintendent of Norwood Sanatorium, who stated that in all his experience he had come across only three instances of the cocaine habit, and those not in recent years. It seemed to Dr. Hare that the habit was very infrequent, though the opposite impression was to be gathered from the newspapers. Many people, Dr. Hare thought, took cocaine for a time, and gave it up after a visit to their own doctor. At any rate he had seen only three pure cocaine cases, though he recalled many cases in the old days at the sanatorium—especially cases of doctors—in which cocaine had been used as an auxiliary to morphine. Dr. Campbell took up the remark of Professor Dixon that the individuals most liable to drug addiction were those of a peculiarly nervous temperament. But on what did the nervous temperament in general depend? In the speaker's view it depended essentially on the condition of the blood, and not primarily upon the nervous system. The blood normally contained stimulants, and to some extent depressants. When the stimulants were in excess the individual had the joy of life, and when the depressants were in excess he was miserable. It had occurred to him that the inherited tendency to drug addiction was essentially a blood defect—the action of defective blood upon the mind organ. The action of alcohol and stimulating drugs was to provide something which the normal individual received adequately from his blood. He had met with a case of periodic craving for cocaine, and his explanation was that the blood underwent periodical changes which at certain times made the craving for stimulants difficult to resist, while at other times there was no craving at all.

Dr. O. INCHLEY hoped that if Dr. Campbell's view of the causation of the nervous temperament was correct there might sooner or later be evolved a method of treating the fundamental cause of these addictions. Dr. F. W. WILLWAY thought that prominence should be given to Professor Dixon's statement that drug-taking in America had not enormously increased as a consequence of the withdrawal of alcohol; statements to the contrary effect were industriously circulated. Dr. ADAMS remarked that there was such a thing as a national physiology and psychology, and that drugs acted differently in different races just as in different individuals.

Sir WILLIAM WILLCOX, from the chair, remarked that he did not know of any case in which cocaine had been used for murder, certainly not in this country of recent years, but a good many cases of suicide by cocaine had been brought to his attention. He had seen cases where people, such as nurses, who had had access to cocaine had taken enormous doses—40 or 60 grains by the mouth. If it was possible to get hold of these cases in time—within an hour or two—there was a good chance of recovery, because cocaine was an unstable alkaloid, and washing out the stomach with permanganate decomposed it. With regard to the production of convulsions by cocaine, there had been three fatal cases at his own hospital, following on the administration of cocaine to the urethra before the passage of a catheter. It was extraordinary how recklessly cocaine was used in former days by certain specialists in treating diseases—solutions of as much as 10 per cent. or even the solid powder were used. He had seen it freely applied to the mucous membrane of the nose. The wonder was that there had not been more fatal cases from the use of this drug. Dr. Copeland had referred to the formation of addiction habits by cocaine substitutes, but it was difficult to say which particular compound would lead to the formation of a habit. During the last two or three months he had seen three cases in which patients suffering from asthma had become mildly addicted to adrenaline; the same could be said, he thought, of a good many other drugs. It was difficult, therefore, to say that a certain chemical would not produce the drug habit. Only time would show. The pure cocaine habit with hypodermic use was very rare; generally the morphinomaniac took cocaine for a change. Cocaine was chiefly used in combination with another drug or as a temporary alternative.

Professor DIXON, in reply to Dr. Dale, said that he did not regard the frequenters of the cafés of cosmopolitan Europe as normal people at all. They were worn-out people, leading an artificial life, and were always in a state of gloom until they became intoxicated with one or other substance. These were the people whose nerve cells were lashed into activity by cocaine so that they lost their lethargy and became violently energetic for the time being. These were the people who took cocaine with avidity; they were neurotics, and had become so in consequence of the unhealthy and unnatural life they had been leading. In a normal person, leading an ordinary life, the result of cocaine-taking was very different; it was so distressing that he was not likely to have any desire to repeat the experience. It was really painful, and how cocaine could produce the unspeakable beatitude and the pleasures so extravagantly described by the writers who had witnessed its effects in Peru he could not understand. These effects could not have been got from cocaine; even drug addicts did not describe the effects in that way. Either the historians thought it correct to indulge in exaggeration, or the coca leaves could not produce quite the same effect as the cocaine. Coca leaves brought over from Peru certainly produced no effect at all, but then Indian hemp brought over in the ordinary way also had no action, although sent in sealed tins from the Himalayas it appeared an absolutely different substance. It might be, therefore, that there was some other property in the coca leaves which did not survive export under ordinary conditions. With regard to the drug habit in America, this had been increasing for many years, independently of prohibition. The emotional condition in which the war left the people accounted, there as in other countries, for some increase in drug addiction. He added, in conclusion, that it was a disgraceful thing that the *British Pharmacopœia* should set out a 5 per cent. solution for cocaine injections. The French *Codex* gave, he thought, a 1 per cent. solution for hypodermic injection, and nothing more than this was ever required.

[1] BRITISH MEDICAL JOURNAL, July 12th, p. 41.

BLOOD CHANGES IN PREGNANCY.

A meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine was held on October 2nd, the President, Dr. H. Russell Andrews, in the chair.

Dr. J. Marrack read a paper on plasma proteins in normal and abnormal pregnancy. Comprised in the paper were the results obtained by Dr. L. J. Coetzee from work in the Hale Clinical Laboratory of the London Hospital. The plasma proteins of normal and pathological women were compared with those of patients suffering from conditions which affected the plasma protein. The changes in plasma proteins in pregnancy, whether normal or abnormal, differed from the changes resulting from the injection of foreign proteins. It was suggested that absorption of foreign proteins might occur in pregnancy, but that the normal protective response failed, especially in conditions of eclampsia. Changes similar to those in nephritis occurred in pregnancy when there was evidence of kidney damage alone, but in the toxaemia of pregnancy and eclampsia the changes characteristic of renal damage were much modified. Dr. Marrack supplied bibliographical references and showed tables of the fibrinogen, albumin, and globulin ratios in various conditions.

The President read a short communication on an unusual retroperitoneal tumour in a multipara, aged 42. He had removed it at an operation believing it to be composed of fat, but during the removal a necrotic patch gave way and about two pints of dark, odourless fluid escaped, suggesting sarcoma. The patient recovered, but three months later had a large mass in the right loin. Microscopical examination of the original tumour showed the presence of spindle-celled fibrous tissue having the characters of fibrosarcoma, but the cells were arranged in well defined bundles and were uniform in size and shape. The lobule was limited by a fibrous capsule, and the President regarded the tumour as a retroperitoneal fibro-lipoma, with a fibrosarcomatous focal area of histologically low malignancy.

A clinical demonstration preceded the two papers and discussion.

THE PRODUCTION OF CLEAN MILK.

A meeting of the London Association of the Medical Women's Federation was held on October 14th, the President, Miss M. Chadburn, being in the chair.

Dr. Stenhouse Williams, in opening a discussion on clean milk and its production, pointed out that the milk industry had hitherto had little help or guidance from the medical profession in producing clean milk, but only those actually in the industry could fully appreciate the difficulties and work out their solution. Since the establishment, under the auspices of the Ministry of Agriculture, of the National Institute for Research in Dairying in 1913 at Reading, the local farmers had been interested in the ideals there put forward. The abolition of dirt in milk was a problem which must be approached from an economic standpoint. Berkshire farmers had shown themselves receptive of the new ideas about asepsis, and six or seven years ago it was generally recognized that a better quality of milk was worth a better price. After a considerable struggle the principle was established that farmers were entitled to charge more for cleaner milk. Three grades of milk were at present available: certified milk, bottled at the farm; Grade A tuberculin-tested milk, bottled by the dealer to whom it was delivered in sealed jugs; and ordinary milk. Certified milk formed only 2 per cent. of the milk supplied in New York at present, and it seemed unlikely that it would ever be possible in New York, or in this country, to supply it so cheaply as to create a large market. Grade A tuberculin tested milk, however, could be produced at a charge of only 1d. per quart more than that of ordinary milk. In New York 2 per cent. of the milk consumed was fresh, 98 per cent. being pasteurized. The alternative to pasteurization was the advocacy of tested clean milk which could be drunk without treatment, but Dr. Williams said that efforts to create a demand by doctors for such milk had been only moderately successful.

Mr. S. Whitley, chairman of the British Dairy Farmers' Association, emphasized the difference between the methods of production of clean milk and those of farming of the old days; these cruder methods still persisted in some farms where no effort was being made at present to improve the quality of milk. The steps in the production of clean milk were as follows: in the first place the cowshed was kept clean and the cows washed and dried before milking began. The milker put on clean overalls and washed and dried his own hands. Mr. Whitley observed that formerly some used to wash their hands in the milk. The old wide-mouthed, open milk pails were now replaced by covered pails, and a lip on the cover prevented dust which had settled on the cover from falling into the pail. The pail was weighed and the contents poured into a tin receptacle, in which the milk was cooled, churned, and sent in a sealed can to a retailer, who was compelled to have a Grade A T.T. licence. Such precautions were worth the 15 to 20 per cent. extra charge that the consumer had to pay. Last year more than 160 farmers were producing higher grade milk. The supply then was greater than the demand, but now, though more farmers were producing this milk, Mr. Whitley understood that the demand was greater than the supply. Many farmers were only waiting to recognize the existence of this demand in order to start producing Grade A milk.

In answer to numerous questions, Dr. Stenhouse Williams stated that Grade A milk could be bought in London at various prices. In hospitals and welfare centres a start might be made in creating a demand which would bring down prices. St. Bartholomew's Hospital was supplied with Grade A milk, and on investigating some complaints as to its keeping qualities it had been ascertained that the milk had been kept too hot—namely, at a temperature of 74° F., whereas it should be kept at 60° F. He admitted the great variability of the price of milk in London districts, and said that the price of Grade A milk ought not to be more than 2d. per quart in excess of ordinary milk; there was no law to prevent dairymen from charging what they could get. A solution of the problem of distribution had not yet been found.

Reviews.

ANAPHYLAXIS.

Dr. Auguste Lumière's book on anaphylaxis[1] is an important contribution to medical literature. Not that there is much in it which has not already been offered to the scientific world, for Dr. Lumière has been working at anaphylaxis many years and has published a great deal on this subject. The book is valuable because it collects all these researches into one volume, and expounds the author's views with a clarity which it is exceptional to meet with in books on this theme.

There is a tendency for monographs on such problems of pathology to develop into dictionaries, to which it may be handy at times to refer, but wherein only the scholar is at home. There is nothing of this atmosphere about Dr. Lumière's book; it is simply written, not overburdened with quotations and references, and is as readable for the uninitiated as for the expert.

The general point of view with regard to anaphylaxis is not strange to pathologists in this country, but some of the conclusions and explanations cover new ground. In brief, he holds that antigen mixed with the blood of a sensitized animal provokes a flocculation in the body fluids, and it is these floccules which are responsible for the manifestations of anaphylaxis. The physical state, and not the chemical composition, of the antigen-antibody complex determines anaphylaxis. This flocculation mechanically stimulates the nerve endings of the endothelium of the vessels in nerve centres, and the accidents of shock are more severe the more sudden this excitation. The vascular endothelium may accustom itself to this stimulation. The abrupt stimulation of nerve centres provokes a sudden vaso-dilatation of visceral vessels and fall of blood pressure. Dr. Lumière maintains that the modifications in the composition of the blood met with in anaphylactic shock have

[1] *Le Problème de l'Anaphylaxie.* Par Auguste Lumière. Paris: Gaston Doin. 1924. (Demy 8vo, pp. x + 241; 46 plates. Fr. 30.)

a direct relation to the intensity of the shock. These blood changes, such as leucopenia and altered leucocyte distribution, are the result of the phenomenon of osmosis and dilution of the blood and different involvement of blood cells. The modifications originate from the vaso-dilatation provoked by the action of floccules on the capillaries of nerve centres. This vaso-dilatation accounts for the osmotic currents which determine retardation of capillary flow, which alter the distribution of blood cells and temporarily modify the physical properties of the serum.

The principles which govern the prevention and treatment of shock may be easily deduced if the above hypothesis is accepted. They consist in avoiding the formation within or introduction into the blood of any flocculent precipitate. When shock exists a certain number of alkaline substances are known which are capable of dissolving the precipitate formed by the union of antigen and antibody. Since the floccules are not identical in all cases, a reagent capable of dissolving some precipitates may modify others. Formulae for some of these solutions are given. Other steps in treatment consist in diminishing the excitability of the vascular system by anaesthetics or depressants, in counteracting the reflex vaso-dilatation by such drugs as adrenaline, and in compensating for the altered distribution of the blood by intravenous injection of fluids.

These are the main lines on which the author's theme is expounded. In a summary so condensed as this the connecting thread of the argument is not so easy to trace as in the narrative of the book. The reader is greatly helped by the excellent arrangement of the book, the well spaced out paragraphs, and the lavish illustrations.

INTERNAL SECRETIONS OF SEX GLANDS.

THE volume entitled *The Internal Secretions of the Sex Glands*,[2] by Dr. A. LIPSCHÜTZ, professor of physiology in Dorpat University, is the second edition of a book published in German in 1919; the author originally intended merely to translate the first edition into English, but he soon found that the advances in knowledge made during the last five years rendered it necessary to rewrite the whole. Dr. F. H. A. Marshall of Cambridge contributes a preface, in which he summarizes the scope of the work as follows:

> "The reader will find in these pages a comparative and connected account of the endocrine functions of the gonads, so far as these are known, in all groups of multicellular animals. The importance of such knowledge has now become generally recognized, and the subjects treated are of profound interest for zoologists and physiologists alike, as well as for medical men, psychologists, and students of eugenics."

The volume is well illustrated and the lists of references, numbering altogether nearly a thousand, are very complete. The predominating note is caution, for the author has examined all the available evidence, and has avoided hasty generalizations, distinguishing carefully between proven fact and attractive but unproven hypothesis. This is in very pleasant contrast with much that has appeared on this subject. Endocrinology as a whole has suffered much from inaccurate work, but the endocrine action of the gonads has perhaps suffered most of all.

Dr. Lipschütz not only shows that the mode in which the sex organs regulate the development of the rest of the body is extremely complex, but presents evidence which suggests that it may very probably prove to be even more complex than we at present imagine. It is therefore difficult to give any short summary of the most important conclusions arrived at in the book, but a few points of special interest to medical men may be mentioned. The discussion of the actions of extracts of testicles and ovaries makes it plain that the results obtained both in feeding and with injection are extraordinarily contradictory. The author quotes evidence that injections of testicular extracts produce a general stimulant action on man, but adds: "One can scarcely say that these experiments on men provide proof of a specific testicular internal secretion." Experiments on the effects of injecting testicular extracts into animals are, however, quoted which provide evidence for the existence of such a specific testicular secretion.

The caution of the author in accepting evidence that extracts of the gonads produce any effect whatever, even when injected, provides an amusing contrast to the confident manner in which commercial preparations of these glands are recommended for cures of half the known diseases. On the other hand, the favourable results of transplantation of ovaries or testicles are considered to be firmly established, and a full account is given of the production of intersexuality by the grafting of testicles into females and ovaries into males. A description is given of the satisfactory effects obtained in Germany by transplanting human testicles into men castrated by war wounds. One very curious case is mentioned, in which the testicle of a normal man was transplanted into a confirmed homosexualist, with the result that the latter was cured of his abnormal propensities and married within a year. This seems to open up some interesting new possibilities for what might perhaps be called medico-legal therapy.

A chapter is devoted to the subject of rejuvenation, and an account is given of the work of Voronoff and Steinach. The author maintains his habitual caution in dealing with the results reported, but the evidence mentioned seems to show conclusively that the methods of both Voronoff and Steinach can produce remarkable rejuvenation (or rather regeneration), and that the effects may last for more than a year.

The third edition of Dr. WEIL's book has been translated into English this year, and published under the title *The Internal Secretions*.[3] The translator asserts that the volume is completely up to date, because he has had the assistance of the author in editing the translation. In it an endeavour is made to give a general account of the action of the organs of internal secretion in the space of 287 pages. The method followed is to take each important physiological function of the body in turn and to discuss the way in which it is influenced by the internal secretions. Half the book, however, is occupied by two chapters—one on metabolism and the other on growth and bodily form. Carbohydrate metabolism is discussed without mention of insulin—an inexplicable omission. The interest of the author, however, is centred largely on the influence of the sexual glands on metabolism and growth. He has not attempted to give references, for this would have been impossible in so small a work. The general impression gained from its perusal is that a laudable attempt has been made to summarize existing knowledge regarding the action of the ductless glands on the body, but that the result cannot be regarded as wholly satisfactory, one reason being that endocrinology is still in a stage when few statements can be made which will meet with general acceptance. Furthermore, this book deals especially with the sexual glands and their mode of action; as organs of internal secretion this is even more uncertain than that of the other endocrine glands. In default of really reliable evidence, the natural tendency is to accept any that seems to support the most attractive hypothesis, and hence a summary, though it may be plausible and interesting, tends to become rather unsound.

SURGICAL PATHOLOGY.

A GOOD up-to-date textbook on surgical pathology, as distinguished from the general pathology to be found in the ordinary textbooks of surgery, has been a long-felt want. Some such books are good museum catalogues, others are good discussions of *post-mortem* anatomy, nearly all fail in that they do not describe in sufficient detail the naked-eye appearances of pathological changes in the living tissues. Professor MCFARLAND of Pennsylvania University has written a book on *Surgical Pathology*[4] which, though excellent in many respects, rather falls between two stools. It is too advanced for the average student, and lacks

[2] *The Internal Secretions of the Sex Glands: The Problem of the Puberty Gland.* By A. Lipschütz, M.D. Cambridge: Heffer and Sons, Ltd.; Baltimore: Williams and Williams Company. 1924. (Demy 8vo, pp. xviii + 513; 142 figures. 21s. net.)

[3] *The Internal Secretions, for the Use of Students and Physicians.* By Dr. A. Weil. Authorized translation of the third German edition by J. Gutman, M.D., Phar.D., F.A.C.P. London: George Allen and Unwin, Ltd. 1924. (Demy 8vo, pp. xviii + 287; 45 figures. 12s. net.)

[4] *Surgical Pathology.* By Joseph McFarland, M.D., D.Sc. London: H. K. Lewis and Co., Ltd. 1924. (Roy. 8vo, pp. xiv + 701; 435 figures. £2 2s. net.)

a good deal of the simple general information which would be useful to those beginning to specialize in surgery, and it is to them that the book is especially addressed. The author says truly that the stress of modern life tends to divert the mind from the path of leisurely scholarly attainment; and though few surgeons are likely to have time to read this book from cover to cover they will probably find it useful as a book of reference. Breaking with precedent the author has felt himself free to proceed on his own lines, presenting old facts and theories, adding new ones, and criticizing their relative values. He divides his book into three parts. Part I deals with congenital conditions of surgical interest. This is well arranged and gives a detailed description of developmental abnormalities. It is useful to have under one cover all the information on this difficult and complex subject.

Part II deals with tumours. The classification followed is that devised by Adami; the subject is arranged under two main headings—of the simple blastomata and the malignant tumours. It would seem to be a mistake to include all the epithelial tumours under the heading of malignant tumours.

Part III deals with the general pathology of the various organs, and here some defects are to be found. For instance, the pathology of the breast occupies more space than that of the whole of the alimentary tract, and the subjects of obstruction and strangulation are scarcely mentioned; the acute infections are not dealt with and the chronic only briefly. It would seem that the author has not considered the pathology of shock, blood transfusion, anaphylaxis, and immunity to come within the scope of his book. Nearly all the illustrations are borrowed, and some of the few which appear to be original are not well reproduced. Perhaps the high standard of the first part has led us to expect too much. The section on the mammary gland deserves special notice. The author has some trenchant remarks on this subject, and "chronic mastitis" has no place in his vocabulary.

RETINAL VENOUS THROMBOSIS.

The second of the Monograph Supplements[5] issued by the *British Journal of Ophthalmology* is a clinical study of 62 cases of retinal venous thrombosis followed over many years by Mr. R. Foster Moore. The investigation on which it is based was originally begun in 1913, when the author held the Lang Clinical Research Scholarship at Moorfields Eye Hospital, and it was his intention to have kept the patients under observation for not more than three years. But the war intervened, with the result that, while some of the cases have been lost sight of, the course of the majority has been followed for a much longer period than was at first intended, and thus the records are very complete. This research on a subject which the author has made peculiarly his own is, it is needless to say, a most careful and painstaking piece of work. It can safely be asserted that no ophthalmologist and but few physicians can afford to be without a copy. No abstract can do justice to it, but we may extract the following points from the author's summary.

The outstanding cause is arterio-sclerosis. In 70 per cent. of the cases of tributary vein thrombosis the superior temporal vein was the branch affected. After thrombosis of a vein has occurred an attempt to re-establish the circulation, either by development of new collateral channels or by canalization of the clot, is usually to be observed; both processes may occur in the same eye; but though the circulation may eventually be re-established in large measure, the functions of the retina are not correspondingly recovered. Haemorrhages in the retina are the rule, and in few cases does it ever become free of haemorrhage; exudation patches are common, but pigmentary change is much rarer. In about one-third of the tributary cases, central vision of 6/36 or better resulted; in central vein thrombosis the rule is that no useful vision is maintained.

With regard to the visual fields, in tributary cases a sector-shaped defect does not occur, but some loss of field corresponding with the blocked vein is occasionally seen. In central vein cases the peripheral field is often, at first, surprisingly complete, but later on a general or irregular contraction occurs. In central vein cases it is usual for the tension to be less in the affected than in the unaffected eye; in a few instances the reverse is observed, and these are probably cases in which acute glaucoma subsequently develops. In tributary cases there is no difference in tension between the two eyes. The study of this series confirms the view that high general blood pressure does not affect in any way the intraocular tension. Acute glaucoma developed in none of the tributary cases.

Of the cases in this series, 41.6 per cent. were known to have developed eventually a gross cerebral vascular lesion, and the average duration of life after the onset of venous thrombosis was 5.8 years.

It only remains to say that the monograph is illustrated by 31 charts of the visual fields and by 32 diagrams. It is a work that must be studied in the original, for it is a most valuable addition to clinical knowledge of retinal venous thrombosis.

[5] *Retinal Venous Thrombosis.* By R. Foster Moore. London: G. Pulman and Sons, Ltd. 1924. (Roy. 8vo, pp. 90; 32 figures, 31 charts. 5s.)

SIR J. C. BOSE'S RESEARCHES.

The treatise by Sir Jagadis Chunder Bose, F.R.S., entitled *The Physiology of Photosynthesis*,[6] is really a monograph on a problem in physiological botany, and as such cannot receive more than a short notice in a journal primarily for clinicians. The author describes in detail the various experimental methods whereby he has studied the evolution of oxygen by the living green plant (*Hydrilla verticillata*). All his methods are highly ingenious, especially those whereby electricity is employed in obtaining automatic records of such phenomena as the rate of production of oxygen, the intensity of light, the measurement of temperature, and the gain in weight by the plant through its synthesized carbohydrate. Since only elementary mathematics are used to deal with the statistical data obtained, and most of the functions investigated have their curves constructed, the results of each experiment can be rapidly apprehended. Sources of fallacy which could vitiate conclusions seem to have been carefully guarded against. The theoretical principle of "physiological inertia" as affecting photosynthetic induction is referred to in an interesting manner when this subject is being discussed (p. 87). The sixty illustrations are conspicuously clear. No one interested in a typically modern experimental research into one of the fundamental activities of vegetable protoplasm will regret examining this work.

The Scientific and Other Papers[7] of Rai Chunilal Bose Bahadur, C.I.E., I.S.O., M.B., F.C.S., are the outcome of filial and avuncular regard on the part of J. P. Bose, M.B., for the papers are his father's, but they are dedicated to his uncle. These are discourses on a very large number of the most diverse topics, from the chemistry of foods, toxicology, and pharmacology, through diabetes, small-pox, and medico-legal problems, to paper making and the chemistry of matches. Some of the papers were originally given as lectures. Several have more than ephemeral interest; of such are the articles on diabetes in India; the prevention of small-pox; "On the necessity for an Act restricting the free sale of poisons in Bengal"; and the "Bhowanipore food-poisoning case." It is not easy to see for whom exactly these papers have been published, because, for one thing, some of them were written as long ago as from 1892 to 1907. The chemical, pharmacological, and toxicological reports represent much excellent laboratory work. There is a full index. The paper used for the book is of poor quality, and there is about the binding and "get-up" generally an indefinable air of amateurishness.

[6] *The Physiology of Photosynthesis.* By Sir Jagadis Chunder Bose, D.Sc., F.R.S., Director, Bose Research Institute, Calcutta. London: Longmans, Green and Co. 1924. (Demy 8vo, pp. xvii + 287; 60 illustrations. 16s. net.)

[7] *The Scientific and other Papers of Rai Chunilal Bose Bahadur, C.I.E., I.S.O., M.B., F.C.S.* Edited by J. P. Bose, M.B., F.C.S. Vol. I. Calcutta. 1924. (Cr. 8vo, pp. xxiv + 523; 11 illustrations. Rs. 5.)

THE ABUSE OF COCAINE.

IN a volume of about one hundred pages Drs. JOËL and FRÄNKEL have attempted to give an account[8] of the history and present extent of cocaine abuse and of the physical and psychical effects it produces. They say that before the war the cocaine habit was practically confined to the prostitutes of the large capitals, and that it was only during the war that it became at all prevalent in Europe. It is interesting to learn that excess in the chewing of coca leaves must have been frequent amongst the South American Indians, for as early as 1569 the Spaniards condemned the drug, and later tried to stop its cultivation on account of the damage it did to the Indians.

In the volume under review three stages of intoxication are described. (1) The euphoric stage is associated with a true stimulation of the higher centres of the brain; the powers of sensation and psychic activity are increased. (2) This is succeeded by a stage of intoxication, in which the feeling of general well-being is changed to one of anxiety, often associated with delusions of persecution. The frequent crimes associated with cocaine abuse are usually committed in this stage. (3) Finally comes the stage of depression or reaction, during which there is general lowering of the functions of the higher centres of the brain, and the subject feels utterly exhausted, both physically and mentally.

The effects of cocaine resemble those of alcohol rather than those of morphine, for the cocainist is an extrovert; he is confident of his own brilliance and seeks companions to impress. The aphrodisiac action of the drug is held to be an important factor in its abuse; this action, strongly marked in women, is much more irregular in men; cocaine, indeed, often renders the male impotent. The reason for this difference between the reactions of the two sexes is unknown.

The book concludes with reports of numerous cases of cocainism. The authors give an account of a subject upon which little reliable literature is at present available. The book is, however, rather diffuse, and could have been improved by more careful editing. It should be read in the light of the recent discussion on cocaine addiction, of which a full report appears at page 765 of our present issue.

NOTES ON BOOKS.

THE Pickett-Thomson Research Laboratory is affiliated with St. Paul's Hospital, London; it was completed in August, 1922. We have received an elegant volume, the *Annals of the Pickett-Thomson Research Laboratory*,[9] vol. i, No. 1, July, 1924, which is offered to the public at 25s. net. It contains five contributions by Dr. D. Thomson, the first three dealing with researches on the virus of variola-vaccinia, on the etiology of measles, and on the etiology of scarlet fever; the fourth with researches on the best methods of detoxicating vaccines without destroying their antigenic properties; and the fifth with the classification of germs by microphotography. It does not appear that any of these papers have been previously published. The first three contain a fairly comprehensive review of the present state of knowledge of these matters, together with an account of some personal research work. The remaining contents of the volume consist of an abstract of a paper by Dr. T. N. V. Potts (Assistant M.O.H. Newcastle) on the treatment and prevention of the oto-rhinological complications of scarlet fever by vaccines, a short paper by Dr. M. Saini of Paris on the relation of agglutinins and antibodies to detoxicated vaccines, and some observations on the treatment of cases of gas poisoning (resulting from the demolition of gas shells) by the medical staff of F. N. Pickett et Fils. The volume contains 216 pages and some excellent illustrations. It is not clear to whom the information in these various papers is addressed. Such a book as this cannot have a wide circulation, and one wonders why the authors of the papers herein contained have chosen this instead of the usual channels of communication with medical readers. There exist many different learned societies to which pathologists are invited to submit their research work. Such papers as these are then discussed and reported in the proceedings, or made available to all through the monthly or quarterly journals of scientific societies. Owing to the multitude of scientific journals a prolonged search is often necessary in order to trace information on any one of the nine different subjects dealt with in this one book. Those who contribute to such a volume as this might well ask themselves whether they would not find a more extensive audience, and also lessen the labours of their colleagues, if they took their material in the first place to special societies, when their papers would be published in the various transactions in which their possible readers are accustomed to search.

Professor ALFRED GROTJAHN'S work on social pathology, of which the third edition[10] has recently appeared, is divided into two parts. The first or special part, which consists of seventeen chapters, is devoted to the consideration of various diseases and their social significance. The chapters on acute and chronic infections, sexual diseases, and prostitution, diseases of the skin, industrial intoxications, rheumatism, and nervous and mental diseases, have been written by Professor Grotjahn, and the remainder, which deal with respiratory, circulatory, and alimentary disorders, pediatrics, gynaecology and obstetrics, surgical diseases, cancer, ophthalmology and oto-rhino-laryngology, have been contributed by Drs. Lewinsohn, Salomon Wolff, Hamburger, and Keyser. The second or general part consists of six chapters, all written by Dr. Grotjahn, in which he considers successively the social importance of the various groups of diseases, the social value of medicine, hygiene, hospitals, and other institutions, and the qualitative and quantitative regulation of the propagation of the species.

THE National Council for the Unmarried Mother and her Child has published this year its sixth annual report.[11] It contains, however, very little that is of general interest, as it has been purposely curtailed in order to admit of the publication in pamphlet form of a special statement of the work of State and voluntary organizations for the unmarried mother and her child, with a view to its wide distribution amongst overseas guests visiting the British Empire Exhibition. The report records with the greatest satisfaction the placing of the Bastardy Act on the Statute Book in 1923, although that Act contains only a small remnant of the bill prepared by the National Council. The Legitimacy Bill and proposals for a bill dealing with affiliation orders are also referred to, but the report is otherwise brief and unimportant.

The thirty-third edition of the Charity Organization Society's *Annual Charities Register and Digest*[12] provides a classified register of the various charities in, or available for, London. Summaries of the financial receipts and expenditure in connexion with various charities are supplied for the years 1920 to 1922 inclusive. Special attention has been paid to the index of societies and charitable agencies, and consequently the useful information contained in the book has been rendered even more accessible than hitherto. The classification of charities adopted in previous years is retained generally, the institutions being grouped according as they provide relief for such afflictions as blindness and deafness, relief for sickness, and permanent or temporary distress, or in reformatories and other educational institutions, or agencies for facilitating employment and emigration.

Messrs. J. and A. Churchill have issued in pamphlet form a short *Medical Guide to the Principal British Spas and Climatic Health Resorts*.[13] This is substantially a reprint (with illustrations) of the health resorts section of the current *Medical Directory*, prepared under the editorship of Dr. R. FORTESCUE FOX. It includes, also, lists of hotels, hydros, and other residential accommodation at the various marine and inland watering places.

Smith's Physicians' and Surgeons' Visiting List for 1925[14] is a handy pocket volume, including a diary of a week to each page, and 32 pages of information and tables useful to general practitioners. Ruled pages are provided for obstetric and vaccination engagements and various memoranda. The volume is well bound; it contains a pencil and two pockets for loose papers, and a useful index.

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[8] *Der Cocainismus: Ein Beitrag zur Geschichte und Psychopathologie der Rauschgifte.* Von Dr. E. Joël und Dr. F. Fränkel. Berlin: Julius Springer. 1924. (Roy. 8vo, pp. 111. 1 dollar.)

[9] London: The Pickett-Thomson Research Laboratory. 1924. (Demy 4to, pp. viii + 216; 30 plates. 25s. net.)

[10] *Soziale Pathologie.* Versuch einer Lehre von den sozialen Beziehungen der Krankheiten als Grundlage der sozialen Hygiene. Von Professor Dr. Alfred Grotjahn. Dritte neubearbeitete Auflage. Berlin: Julius Springer. 1923. (Demy 8vo, pp. 536. Bound, £1 2s. 1d.)

[11] London: Carnegie House, 117, Piccadilly, W. (8vo, pp. 12. 4d.)

[12] *The Annual Charities Register and Digest.* Thirty-third edition. London: Longmans, Green and Co. (Demy 8vo, pp. xx + 533. 7s. 6d. net.)

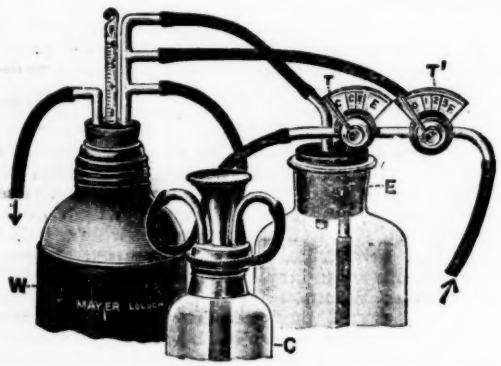
[13] London: J. and A. Churchill. 1s. net.

[14] *Smith's Physicians' and Surgeons' Visiting List, Diary, Almanack, and Book of Engagements for 1925.* Seventy-ninth year. No. 1a edition. London: Hazell, Watson, and Viney, Ltd. (Cloth, 6s.; morocco, 8s.)

MEDICAL AND SURGICAL APPLIANCES.

Warm Ether.

DR. FRANCIS E. SHIPWAY (London, N.W.) writes: I have been using for many years an additional tap, T′, to my warm ether apparatus for the purpose of giving a constant supply of oxygen with variable amounts of ether, chloroform, or mixtures of the two. The tap T′ in the position 0 directs all the oxygen



to the patient; by moving it clockwise oxygen is passed through the anaesthetic in increasing amount, until in the extreme right position all the oxygen passes through the anaesthetic (this would be chloroform in the illustration). This simple arrangement has proved very useful and makes the administration extremely easy.

LUNACY AND MENTAL DEFICIENCY.

BOARD OF CONTROL'S REPORT.

THE tenth Annual Report of the Board of Control for the year 1923 has just been issued.[1] The most striking statistical fact in this report is the very large number of notified insane persons under care in England and Wales on January 1st, 1924. The number is 130,334, showing an increase of 4,053 on that of the preceding year, and is the highest yet recorded. This increase does not necessarily connote any increase in the incidence of insanity amongst the general population. What factors are to be held accountable for its production the Board intends to consider in a future report; in the meantime attention is drawn to the exceptionally low death rate for the year in question—1,036 fewer than in the preceding year—a fact which partially accounts for the startling increase. First admissions during the year totalled 18,934.

Owing to the accumulation of cases in mental hospitals, the question of accommodation is rendered particularly acute. The Board urges the necessity of a thorough consideration of this problem, but in the meantime draws attention to certain provisional remedies. A fuller use of the powers conferred under Section 25 of the Lunacy Act of 1890, whereby patients may be sent from mental hospitals to Poor Law infirmaries, should be exercised. Absence on trial and boarding-out, wherever practicable, should be allowed. The provision of nurses' homes within the grounds or of hostels outside would not only increase the available accommodation, but would benefit the nurses themselves, as at present more nurses sleep in the institution than are necessary for its proper control. It is recognized that local authorities are compelled to limit their expenditure owing to the widespread financial stringency; but the construction of separate admission hospitals and of detached villas for convalescent cases, where means permit, would relieve considerably the present congestion and be of decided benefit to the patients concerned.

As regards diseases, there is a notable diminution in the incidence of tuberculosis as compared with the previous year, but this still remains high (seven or eight times greater than in the general population, in spite of recent reductions). Various theories have been put forward to account for this state of affairs: mental and physical peculiarities of the patients, dietary deficiency, intramural ward infection. An understanding of the relative potency of these factors in the production of the disease is very necessary. There is a marked reduction in the incidence of dysentery and its mortality rate. Thirteen cases of pellagra were notified during the year; this disease was responsible for 10 deaths—9 among patients and 1 amongst the staff. In recent years there has been a considerable reduction in cases of general paralysis and a corresponding fall in the number of deaths from this disease. The earlier recognition and treatment of syphilis partly accounts for this reduction in incidence; but it must also be borne in mind that previous to the systematic use of facilities for accurate diagnosis of the disease, an appreciable number of cases were erroneously regarded as general paralysis. Consideration is given to the unfortunate mental sequelae of encephalitis lethargica. The Board has been in consultation with the Minister of Health on this matter, and it is hoped to formulate better means for studying, treating, and preventing these post-encephalitic mental conditions.

There is a considerable number of patients at present in mental hospitals who could be more suitably dealt with in institutions for mental defectives. Such institutions are all too few, however, and urgently require to be supplemented.

Much remains to be done if continuity of care is to be secured for all mentally defective persons who cannot take care of themselves. The full benefit of the Mental Deficiency Act as regards the prevention of suffering, crime, destitution, inebriety, and disease cannot be secured until the provisions of the Education Acts dealing with mentally defective children are brought into complete operation. Although the powers and duties of all local authorities under the Mental Deficiency Act are the same, the Board of Control indicates how varied is the quantity and the quality of the work undertaken. In some urban centres there is the closest co-operation between the local education authority and the committee for the care of defectives, and the numbers of mental defectives have been ascertained, the great majority of whom are in special schools. In other centres such co-operation is lacking. There is no methodical inquiry into the number of mentally defective persons, beyond those especially brought to notice. The benefits afforded by the Mental Deficiency Act are not being utilized.

The number of defectives ascertained for the year 1923 was 35,413, as compared with 25,470 for the previous year. This increase shows an improvement in the activities of the local authorities; but there is still ground for believing that local authorities are still in ignorance of many cases of defect in their districts. Authorities are urged to make more use of the powers conferred in Section 30 of the Act, allowing cases under guardianship. It is also suggested that Section 7 of the Act be amended so as to allow of the transfer of a defective from an institution to guardianship.

The very great difficulty of treating large numbers of violent and dangerous defectives is readily acknowledged. The former methods of certifying such patients as insane and transferring them to mental hospitals did not prove satisfactory. The Board realizes the necessity of facilities for isolation, and "it is significant that the opportunity afforded for solitude is greatly appreciated by the patients themselves." The co-operation of the Central Association for Mental Welfare in all questions relating to mental deficiency is gratefully acknowledged.

The report refers to the abandonment of the Mental Treatment Bill, whose provisions have had the particular attention of the Board, who finds a "general consensus of opinion in favour of allowing early cases of mental disorder to be received for treatment for a period without certification, under proper safeguards, and of extending to public mental hospitals the power to receive voluntary boarders." As recorded lately in our columns, special powers authorizing the reception and treatment of voluntary boarders at the Maudsley Hospital were granted under the London County Council Act of 1915, and the extension of similar powers to public mental hospitals cannot but be fraught with the greatest benefit to the mentally afflicted.

[1] Board of Control. Tenth Annual Report. H.M. Stationery Office, Imperial House, Kingsway, W.C.2. 10s. 6d. net

British Medical Journal.

SATURDAY, OCTOBER 25TH, 1924.

THOMAS LINACRE, 1460–1524.

On October 20th, 1524, Thomas Linacre, the founder of the Royal College of Physicians of London, died at his house in Knightrider Street, and was buried in St. Paul's Cathedral. Four hundred years have elapsed since that event, but the anniversary of his death cannot be allowed to pass without some reference to the great and lasting benefits his labours conferred upon this country in his capacity as an enlightened physician and as a scholar of European renown.

Born at Canterbury, he was educated at the monastery school of Christ Church in that city under the guidance of William Selling, who was one of the first in this country to acquire and spread the knowledge of the Greek tongue. In 1480 Linacre removed to Oxford, and under Cornelio Vitelli applied himself to the study of Greek. In 1484 he was elected a Fellow of All Souls, and in 1485 he travelled to Italy for the purpose of perfecting himself still further in Latin and Greek. Arrived there, he visited Bologna, where he availed himself of the instruction in Latin of Politian, and Florence, where he came under the influence of Chalcondylas, who refined his already extensive knowledge of Greek. He then repaired to Rome, Venice, and finally to Padua, where he took the M.D. degree of that university with great applause.

His visit to Italy exercised a profound effect upon his mind. He came to that country thirty-two years after the Greek Empire at Constantinople had ceased to exist, and he found the Italian universities full of students striving to acquire the inestimable results of the revival of the Greek spirit which had been brought to Italy by the refugee Greek scholars. He was impressed with the manner in which facilities were afforded in the universities for the prosecution of the quest for knowledge in all its branches. Padua was at that time nearing the zenith of its influence, and it was there that he first conceived the idea of devoting himself to the study of medicine. His main purpose in visiting Italy was the acquirement of scholarship, and with his rich endowments in this intellectual sphere he could have had little difficulty in performing the exercises necessary for the medical degree, since they were purely scholastic and only required a knowledge of the ancient medical authors. He must have compared these intellectual centres in Italy, vibrating with life, with the sterile conditions existing at Oxford, where the barren scholasticism still held sway. While preparing for his degree in medicine at Padua he had observed the attention paid to that subject. The care bestowed upon the study of medicine in Italy made an indelible impression upon his mind, and when in after years he resolved to improve the condition of physic in his own country it was after the Italian model that he shaped his College of Physicians.

On his return from Italy, about the year 1487, Linacre resided at Oxford, where he continued his studies in classics and medicine, and it was during this period of his life that he devoted himself, with his friends Grocyn, William Latimer, and Erasmus, to the work of promoting the revival of letters in this country. In 1501 he was summoned to the Court to undertake the dual duties of preceptor and physician to Prince Arthur, and became physician to Henry VII and Henry VIII. About the year 1509 Linacre entered the Church, and for the remainder of his life devoted his attention to the study of theology and to his duties as a cleric. It was not until 1518 that he was able to put in operation his cherished scheme of founding a College of Physicians for the purpose of promoting and controlling the activities of those who were engaged in the practice of medicine. At that time the conditions in England regarding the practice of medicine were deplorable. No attempt to control the practitioners in the country was effective, for the Act of 1511, giving power to bishops or their vicars-general to license those wishing to practise medicine, had proved of little use. The country was filled with ignorant men who had had no training in medicine, and who practised their calling without let or hindrance. Linacre desired to elevate the profession of medicine, and to secure, for the benefit of the country, men who had been properly trained and who were renowned for learning and knowledge of medicine. His aims were realized on September 23rd, 1518, when King Henry VIII granted a charter to Thomas Linacre and five other physicians to form a College of Physicians for the purpose of electing other physicians who, in the opinion of the College, were worthy of that distinction. The charter at first gave the College power to regulate the work of all physicians in London and seven miles around, but in a little time its provisions were enlarged to include control over all who practised medicine in England with the exception of those who were doctors of Oxford or Cambridge. Thus, through the inspiration of Linacre, came into being the Royal College of Physicians, which has existed now 406 years. Throughout its history the spirit of Linacre has exercised a profound influence over its character. Linacre was a great scholar, and it was his desire that scholarship should go hand-in-hand with medicine. Modern developments in medicine have rendered this difficult or even impossible, but through all the changes the College of Physicians has always been closely associated with high intellectual attainments, which were so prominent in the founder.

Linacre's influence upon medicine did not end with the foundation of the College of Physicians. He established two lectureships at Oxford and Cambridge called after his name, and although they have not exercised any considerable influence over the course of medicine, they are nevertheless evidence of Linacre's desire to improve medical teaching and practice. As the great example of the scholar-physician Linacre stands pre-eminent, and we must never forget that it was largely through his translations of Galen into elegant Latin that physicians were led to study that giant of the Middle Ages, and when they studied they soon began to doubt. Then came Vesalius, Harvey, and Sydenham, and the teaching of mediaeval times was swept away never to return. For all that Linacre accomplished for medicine we commemorate to-day with deep respect and grateful thanks the four hundredth anniversary of his death.

THE PANEL CONFERENCE.

At the Annual Conference of representatives of Local Medical and Panel Committees which was held last week the matters under discussion were of less immediate importance than in recent years, and did not give rise to any serious controversial issues. From the full report which appears in the Supplement it will be seen, however, that at least two questions of moment to the profession occupied considerable attention.

One of these was the case in which a heavy penalty had been imposed by the late Minister of Health on two Lancashire practitioners, and the other was a point of public importance in connexion with evidence to be given before the Royal Commission on National Health Insurance.

In the penal case referred to no one was concerned to defend the practitioners' actions which were called in question; but the report of the official committee of the Ministry of Health which inquired into the facts, disclosed, and even emphasized, a number of considerations which made the offence seem less heinous than at first sight it appeared to be. The Conference was evidently much disturbed by the situation which the action of the Minister has occasioned, and passed unanimously resolutions of protest with regard to two points which seem to be of general concern, and can scarcely be allowed to rest where they are at present, in spite of the evident desire of the Ministry not to reopen them. The correspondence clearly discloses the fact that the penalty—a "fine" of one thousand pounds—was to some extent inflicted in respect of offences which the Minister assumed had been committed, although no evidence of their committal was produced, even after most assiduous attempts to discover such evidence. As one of the resolutions passed by the Conference says, "it is contrary to the principles of English justice to assume offences over and above those proved at the inquiry and to inflict any penalty in regard to such unproved offences"; yet it appears clear, even from the last letter from the Ministry itself, that this is what has been done.

The Conference further protested against the action of the Ministry on an important point of procedure. The Regulations have laid down, in agreement with the profession, certain rules and machinery by which alleged offences are to be investigated. The Insurance Committee concerned, having followed the required procedure, came to certain conclusions. It must be recognized that the Minister, charged by Parliament with the administrative duty of seeing that the medical service is efficient, may properly take independent action in a disciplinary case if he considers such action judicious. In the case in question, however, the Minister, who was in the position of the judge who must finally pronounce judgement, caused a letter to be written asking or directing the Insurance Committee to revise and alter the conclusion to which it had come. This action appears altogether indefensible and even outrageous. It seems evident, on the facts of the whole case, that any Minister of Health who may be in office as the result of the general election may properly be asked to review the judgement of his predecessor.

Another important matter that was the subject of discussion was whether evidence should be given before the Royal Commission with regard to the administration of sickness benefit by approved societies with a view to this benefit being administered by State organizations in their stead. No doubt many complaints are brought to practitioners by their insured patients pointing to serious imperfections in this administration. It cannot, however, be assumed that all such complaints are well founded, and in any case, as was pointed out at the Conference, it is by no means certain that it is wise or right for the medical profession, as such, to concern itself specially with this matter, so long as medical benefit—including all such additional benefits as in fact, if not in law, are of the nature of medical benefit—is entirely separated from approved society administration. This is the fundamental necessity; and it may well be that within their own sphere approved societies, subject to certain general requirements, would do the work of administering sickness and other cash benefits more efficiently and sympathetically than would any organization under State auspices and run by Government officials. The decision of the Conference was that this, as well as other points connected with the evidence to be given before the Commission, should be considered by the Insurance Acts Committee, and that if possible opportunity should be given to Panel Committees and to Divisions of the British Medical Association to consider the memorandum of such evidence before it was finally agreed upon.

FOOT-AND-MOUTH DISEASE.

During September nine outbreaks of foot-and-mouth disease were confirmed in England, and restrictions were still in force in six districts. The cost of the outbreak so far is about £3,500,000, and over 200,000 animals have been destroyed. The American outbreak, which started in February last, has, according to Dr. Mohler, chief of the Bureau of Animal Industry,[1] been practically stamped out. The policy adopted was that of prompt slaughter of infected herds, cleansing and disinfection of infected premises, and compensation of owners for animals and property destroyed. In the more settled areas eradication was promptly effected, but difficulties were met with in the inaccessible and poorly fenced range country; Dr. Mohler, however, expects that the disease will have completely disappeared by the end of this year. The outbreak has cost America over £1,000,000, and 108,000 animals have been slaughtered. The methods adopted do not differ from those in use in this country, except in degree. They were undoubtedly more drastic in their operation, mainly because of the existence of the highly organized Bureau of Animal Industry—a body which has no counterpart in Great Britain. It is stated in the October issue of *Veterinary Medicine* (Chicago) that "when the results in the settled portions of California are compared with the efforts that have been put forth and the results attained in England during the past year in combating the present outbreak of foot-and-mouth disease in that country, the excellence of the American method can be better appreciated by contrast. In England . . . the disease has persisted for more than a year and eradication is not in sight, although the cost of the work has been three times the cost of that in the California outbreak and twenty times the cost of complete eradication in the settled portions of the state. There is no question but that our Bureau of Animal Industry could have eradicated it in that period at any time since its appearance in England or Scotland, if it could have the same co-operation and support from the authorities and the people that it had in California." Even after discounting the influence of the naturally optimistic American spirit, it would seem that their criticism, although exaggerated, is not without truth; and it is well to know the opinion of other countries. In a "slaughter" policy of eradication half-measures are futile and expensive; but we must also realize that such a policy is tolerable only in the almost complete absence of any real scientific knowledge of the etiology of the disease. We have reported at various times the progress of work on foot-and-mouth disease abroad. Early this year Frosch and Dahmen described what they considered to be the causal organism—a minute ultra-microscopic microbe producing cultures the size of a red blood corpuscle. A German commission was appointed to investigate their results, and

[1] *Journ. Amer. Vet. Med. Assoc.*, 1924, p. 760.

in an interim report[2] Professor Lührs states that so far both cultural and experimental inoculations have been without positive results. Frosch and Dahmen were not present at the meeting to which the report was made, and Lührs gave few details. Frosch and Dahmen, however, in a written reply, hold that not only is the report by no means final, but that it is premature, and they claim confirmation of their work by Ruppert of La Plata, who has conducted his experiments on the basis of their published work. Although its specific nature is not disproved, we are not yet in a position to accept the Frosch-Dahmen bacillus as the cause of the disease. The report in the German journals, that the commission had confirmed their results, was apparently due to a misunderstanding. Meanwhile Vallée[3] has given an account of recent French work on the disease. His efforts have been directed towards the solution of the immunization problem. He finds that blood drawn from recovered animals about the twelfth to fifteenth day of the disease has not only a certain curative action, but gives almost complete immunity to susceptible subjects for from six to eight months. Large doses are necessary, and the protection is specific for only one strain—of which there are two. The most recent and most interesting French work, however, has been directed towards obtaining a sensibilized anti-aphthous vaccine, which, without causing a generalized infection, results in only a limited skin lesion which is accompanied by an active immunity. The fact that the red cells absorb the virus—exactly how is unknown—and so render it more controllable, has been utilized. An intradermal inoculation of 0.6 c.cm. of red cells drawn from cattle cured of the disease with all unfixed virus eliminated causes a cutaneous reaction without aphthae and gives a strong immunity. It is hoped by an extension of these experiments to be able to use methods hitherto considered too uncertain or too risky, and to be able to elaborate some technique whereby they can accurately estimate the exact virulence of the virus. The etiology of the disease will be discussed at the November meeting of the Berlin Microscopical Society, when the members of the commission and Frosch and Dahmen will be present.

SPIRITUAL HEALING MISSIONS.

THE daily press has recently contained accounts of spiritual healing missions held by Mr. J. M. Hickson at Frizinghall Parish Church, Bradford, and at St. Michael's Church, Paddington. The Bishop of Bradford (Dr. Perowne) took part in the mission at Bradford, where some 1,200 or 1,300 people seem to have been treated by the laying on of hands. According to newspaper reports some six or eight patients, suffering from diseases of long duration, have been benefited by the mission; and at the end of this month a thanksgiving service is to be held at Frizinghall, when a full statement of the healing results will be given. The cases in which improvement is said to have taken place are an elderly woman with rheumatoid arthritis, a domestic servant whose "right arm had been paralysed from birth," two cases of "spinal paralysis," a woman who had been blind for five years and now asserted that she could see a little, a woman with "paralysis of the left side for over a year," a young woman who had "suffered for ten years from hysterectomy," and a man who had been dumb for two years. The Bradford mission seems to have been very well organized in the matters of transport, commissariat, and police control, and is described in the local press as having profoundly stirred religious thought in the city. One paper mentions the "ecstasy of the cured" and their testimonies to the power of the missioner. We have called attention on former occasions to some of the dangers attached to the emotional appeals of these spiritual healing missions. Dr. Otto May, in a letter to the *Times* on October 20th, emphasizes the emotional element in the cures, and points out the effect of suggestion on functional disorders and on the functional element in disease. While it is no doubt right that the mental element should never be ignored in the treatment of even organic disease, wholesale suggestion of cure must, as Professor F. E. Wynne has pointed out in a letter to the *Yorkshire Post*, inflict the cruelty of disappointment on ignorant sufferers from really incurable maladies. We are glad, therefore, to see that the Bishop of Chichester (Dr. Burrows) warned his Diocesan Council, which was addressed by Mr. Hickson, that patients must be "prepared spiritually to be ready to accept disappointment." Clearly a medical investigator of alleged cures would require more definite diagnoses than those we have quoted from the newspapers, and it is impossible to expect medical men to accept as evidence statements entirely unsupported by, though capable of, investigation. And when we read of "ecstasy" in connexion with these missions we are inclined to think that the organizers might read with advantage *A Cagliostro of the Second Century*, in the fourth series of Froude's Short Studies of Great Subjects.

HYGIENE IN GIBRALTAR.

GIBRALTAR, in actual extent of territory probably the smallest of our colonies, has an interesting and instructive record of sanitary legislation and of the health of its civil population. The density of population and the housing conditions are such as might be expected to give rise to a very high incidence of disease and mortality, for, according to the annual report on the health of Gibraltar for 1923,[1] 1,316 of the 3,480 families who constitute the civil population of 17,346 live in one-room dwellings and in a city area of little over 104 acres. As many as 116 of the families in one-room dwellings are families of six, and 113 are families of more than six persons; while the situation as regards families in two-room dwellings is only a little better, for the highest number (181) among the 846 in such dwellings are families of over six members. Further, it appears that 10,000 Spanish and 1,500 British subjects come into Gibraltar daily from the neighbouring Spanish town, La Linea. This constant traffic is extremely apt to introduce infectious disease into Gibraltar, and, in fact, most of the small-pox epidemics which have occurred in the fortress were traced to foci of infection in Spain or Morocco, both being separated from Gibraltar by only a narrow strip of land or sea. Notwithstanding these detrimental health conditions, the standard of public health in Gibraltar has been maintained at a very high level for many years; this has been due in a great measure to the efforts of a succession of army medical officers, with a wide reputation as sanitary experts, who have held the appointment of medical officer of health. It was in the nineties of last century that the then medical officer of health undertook the task of effecting important alterations in the civil habitations and crowded blocks of one- and two-room dwellings, with a view to introducing light and air into them and providing suitable sanitary accommodation for the occupiers. Amongst other measures, by-laws, based on the model by-laws of the Local Government Board, were drawn up, and in 1892 the present form of annual report on the public health was introduced. The result of these measures was a marked permanent fall in the mortality rate from a figure considerably above to one considerably below 20 per 1,000. During the last ten years only on one occasion—the influenza year of 1918—has it reached that figure. The average for 1913-22 was only 16.9 per 1,000; for the previous ten years 16.13; and for 1923 16.95. These figures represent more or less the

[2] *Berl. klin. Woch.*, October 3rd, 1924, p. 557.
[3] *Ann. Méd. Vét.*, vol. 69, 1924, pp. 241-250, 337-347

[1] *Annual Report on the Health of Gibraltar for the Year 1923.* By Lieut.-Colonel W. C. Smales, D.S.O., R.A.M.C. Gibraltar: Garrison Library Printing Establishment. 1924. (8vo, pp. 17; 3 charts.)

crude death rates for the past thirty years. The birth rate for 1923 was 22.57 per 1,000, and the infantile mortality 109.5 per 1,000 births. The average zymotic mortality for the last ten years was 1.31 per 1,000 of population, but in 1923 it rose to 1.84 owing to a somewhat extensive epidemic of scarlet fever, a disease of rare epidemic occurrence in Gibraltar. Isolation could only be carried out partially, but the cases were comparatively mild, as is the general experience of scarlet fever in tropical or semi-tropical climates. Most of the diseases which can be controlled by sanitary measures or require sanitary investigation are notifiable. They include, for example, gastro-enteritis, tuberculosis, pneumonia, venereal disease, dysentery, Mediterranean fever, and others, in addition to the acute infectious diseases; and the fact that these are notifiable gives Gibraltar a considerable sanitary advantage over many other communities. Pulmonary tuberculosis caused the greatest number of deaths amongst them, amounting to about one-third of the total deaths due to the notifiable diseases in 1923, but the death rate was only 1.3 per 1,000 of population, as compared with 1.62 for England and Wales. Considering the overcrowding and housing conditions this must be regarded as somewhat remarkable, and, apart from general sanitary measures, is probably due to the excellent organization of a "destitute sick and tuberculosis scheme," subsidized by a grant from the Colonial Government. Food and milk are supplied to the destitute and sick poor, home visits are paid by a nurse, and accommodation is provided in a home for early cases of tuberculosis. School hygiene is also carefully supervised, and a soup kitchen was started last winter to supply soup in the school interval to children of the poor. There is also a child welfare centre, which not only advises and instructs mothers in the care of children, but has also distributed milk and other medical comforts to families of the unemployed. The City Council of Gibraltar may with reason congratulate itself on the good results of its public health department and on such excellent auxiliary schemes as these. Neighbouring cities, such as Malaga and Cadiz, have shown very different health results, so that the climate of the south coast of Spain can scarcely be claimed as a factor in diminishing the incidence of tuberculosis and other preventable diseases in a crowded city like Gibraltar.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE Society of Medical Officers of Health, now entering upon its sixty-ninth year, held its annual dinner at the Hotel Cecil, London, on the evening of Friday, October 17th. The new president, Dr. Robert A. Lyster, who had delivered his presidential address at the headquarters of the society earlier in the day, took the chair, and was supported by many well known members of the medical profession; but politicians, owing to the coming election, were absent. Besides the after-dinner speakers those present included Sir William Hamer, medical officer of health for the County of London; Mr. W. H. Savery, chairman of the Housing Committee of the City of London Corporation; Professor Waller S. Leathers, of the Vanderbilt University; Dr. Herbert Jones, Dr. Eustace Hill, and several other past-presidents of the society; Dr. H. B. Brackenbury, Chairman of the Representative Body, and Dr. Alfred Cox, Medical Secretary, of the British Medical Association; and Sir Dawson Williams, Editor of the *British Medical Journal*. The toast of prosperity to the Society of Medical Officers of Health was submitted by the Bishop of Winchester (Dr. F. T. Woods), who welcomed this opportunity of proposing the health of the health preservers of the community, and thus, as it were, offering "a cock to Aesculapius." He urged the need for a wider and keener spirit of helpfulness within the Christian Church in aiding the medical service of the country: the aim of all should be to make England not only fit for heroes to live in, but to make heroes fit to live in it. The president of the society, in his reply, said that no body in the world would welcome more heartily than theirs the powerful aid of the Church in promoting and stimulating the highest ideals of the public health. As a society they had no politics, and he wished to make it clear at the present juncture that any political party that came into power would find in the society a machine able and willing to give expert advice on public health matters. He noted with regret that the proportion of brilliant men entering the public health service was much smaller to-day than in the past; the causes of this serious decline ought to be examined, for in the vast field of preventive work lay a great future for the public health branch of the medical profession. The toast of the Ministry of Health, proposed by the honorary treasurer, Dr. G. F. Buchan, was acknowledged by Sir Arthur Robinson, permanent secretary of the department, who mentioned with regret that three consecutive elections at this season of the year had prevented the reigning Minister from responding to this toast—and civil servants should be neither seen nor heard. The health of the guests was proposed by Dr. Harold Kerr, medical officer of health for the city of Newcastle-on-Tyne. Lord Dawson of Penn, in his reply, complimented the society on its remarkable growth, and urged it to aim at bringing the general practitioner more and more into preventive work. The toast was acknowledged also by Sir Humphry Rolleston, Bt., President of the Royal College of Physicians, Sir Francis Champneys, Bt., Chairman of the Central Midwives Board, and Mr. H. J. Waring, Vice-President of the Royal College of Surgeons. The health of the president was proposed by Dr. Lockhart Stephens, president of the Southern Branch of the society, and Dr. Lyster replied.

THE HOUSE OF LONGMANS.

IN the October number of the *Edinburgh Review* Mr. Harold Cox records and celebrates the two hundredth anniversary of the foundation of the publishing house of Longmans. It was already an old firm when the *Review* first appeared in 1802 under the auspices of Constable and Longman, to be afterwards carried on by the latter firm alone. But the house, if not the firm, is really older than 200 years, for the first Thomas Longman bought a going concern from William Taylor, at the sign of The Ship in Paternoster Row, in 1724, where Longmans is still carrying on the business. Taylor must have had a valuable connexion and stock-in-trade, since Longman paid what was then the very large sum of £2,282 9s. 6d. for it. The odd shillings and pence suggest that he bought it on a valuation. The fact that Taylor was the publisher of the first authentic edition of Robinson Crusoe shows that he was of good standing in the trade. There are no doubt commercial concerns still in existence which are as old or older than the house of Longman, but it is exceptional indeed for any firm which has existed for two centuries to be able to say that any of its partners are the direct descendants of the founder. Yet it is the fact that three Longmans of the sixth generation are now active members of this celebrated firm. Its history is bound up with that of English literature since 1724. Longman was one of a number of publishers who were jointly responsible for the production of Johnson's dictionary, and the sufferings of many generations of schoolboys were associated with Lily's Latin grammar, despite which book, or with its help, some of them acquired their first knowledge of classical literature. Buckley and Longman together acquired by purchase from the patentees the Royal grant and privilege of printing that celebrated work, in the preparation of which Colet and Erasmus had no small share. It appears probable, too, that Thomas Longman the second had some interest in the production

of the *Times*. Coleridge, Wordsworth, Walter Scott, Southey, Tom Moore, and Byron all entrusted the publication of their poems to this firm, although Byron soon transferred his works to John Murray. Macaulay, Lecky, and, indeed, a majority of the great writers of the nineteenth century, had their books published by Longmans, including some of the best known writers of fiction, such as Rider Haggard and the author of *Dr. Jekyll and Mr. Hyde*, and essayists such as Andrew Lang. Mr. Harold Cox reminds us that *Gray's Anatomy* was and is published at the sign of The Ship, but he omits to mention *Quain's Anatomy* or any of the important medical works which bore Longmans' name on their title-pages. One of these is *Quain's Dictionary of Medicine*, and at the present time four pages of their catalogue are filled by the titles of medical and surgical works, although the business of medical publication is now largely in other hands. The present firm may claim an antiquity beyond 1724, for in 1890 the business of the then house of Rivington's, which dated from the very early years of the eighteenth century, was transferred to it, with all its associations, and including that valuable and ancient periodical, the *Annual Register*.

THE HARVEIAN FESTIVAL.

THE Harveian Festival of the Royal College of Physicians of London consists of a short series of quiet and friendly ceremonies on St. Luke's Day, of which the centre and chief is the Harveian Oration, which was delivered this year by the Regius Professor of Medicine in the University of Oxford. The oration has a history of over two centuries and a half, and we must admire the grace and ingenuity with which orator after orator has succeeded in finding a new subject, or a new aspect of an old subject. Sir Archibald Garrod succeeded once more, for though we have heard much of the debt of medicine to science, we have seldom been reminded of the debt of science to medicine. The oration and dinner were attended this year by the distinguished French physician Professor Calmette, who was presented with the Weber-Parkes Medal; Dr. Achard, Permanent Secretary of the Académie de Médecine of Paris, by which British representatives were so cordially entertained at the celebration of Jenner and Sydenham; and Professor Chauffard, who returned thanks for his colleagues at the Harveian dinner. Other guests at the dinner were Lord Sumner, who responded to the toast of the guests; the Dean of Christ Church; Sir Arthur Stanley, G.B.E.; Dr. G. L. Gulland, Professor of Medicine in the University of Edinburgh, and Dr. T. K. Monro, his colleague of Glasgow; Sir John Bland-Sutton, President of the Royal College of Surgeons of England; Dr. E. W. Ainley Walker, Dean of the Medical School of Oxford University; and Sir Leonard Rogers, Moxon Medallist.

THE SADLIER SERMON.

AFTER a lapse of many years the annual Sadlier sermon was delivered in the presence of the Lord Mayor of London on St. Luke's Day, October 18th, in the Church of St. Mary-le-Bow, by the rector, Canon S. G. Ponsonby. Dr. William Croone, a Fellow of the Royal College of Physicians, originally designed a plan for two annual lectures to be delivered, one before the College of Physicians, the other before the Royal Society, together with a sermon to be preached at St. Mary-le-Bow. After his death in 1684 it was discovered that his will contained no provision whatever for the endowment of these lectures. His widow, a daughter of Alderman Lorimer of the City of London, who subsequently married Sir Edwin Sadlier, Bt., fulfilled Dr. Croone's intention by devoting a portion of her estate for the provision of the annual lecture, now called the "Croonian Lecture," and the sermon. In the course of last year the Charity Commissioners approved a scheme confirming the provisions of the will, and empowering the trustees to make grants to augment the income of other lectureships in connexion with the Royal College of Physicians. The proceedings at the service on October 18th included a lesson taken from Ecclesiasticus xxxviii, commencing with the words: "Honour a physician with the honour due unto him for the uses which ye may have of him." Canon Ponsonby opened with an account of the origin of the Sadlier sermon, and next described the character and attainments of St. Luke as recorded in the New Testament and in documents of the early Christian era. He then passed to the consideration of Thomas Linacre, founder of the Royal College of Physicians, and celebrated as scholar, physician, and divine. His Latin translation of Galen was said by Erasmus to be even more elegant than the original Greek. The preacher described the arms granted to the College in 1546, with the representation of a sick man stretching out his arms towards an arm coming from above, and in conclusion referred to the marked and increasing recognition of the power of mind over matter that had characterized the last fifty years. He added that there was no question of substituting spiritual healing for medical ministration, though perhaps there had been some confusion of thought on the part of those who did not understand that physicians had always attributed their success to the spiritual power working through them. They had always conveyed hope and healing to the sick and comfort and consolation to the dying as well as material medical treatment.

THE first social evening of the session of the Royal Society of Medicine was held on October 16th. The new president, Sir StClair Thomson, received the guests in the library, where refreshments were provided and interesting exhibits were on view. Dr. W. T. Grenfell, C.M.G., of Labrador, deeply interested the large audience with a detailed account of his work.

THE Mitchell Lecture before the Royal College of Physicians of London will be given by Sir StClair Thomson at the College on November 6th at 5 p.m. The subject of the lecture is tuberculosis of the larynx and its significance to the physician.

THE GENERAL ELECTION.

NOMINATIONS for the forthcoming general parliamentary election took place on Saturday, October 18th, when the following medical candidates were duly nominated:

The Right Hon. C. Addison (Lab.), Hammersmith South.
Dr. Ethel Bentham (Lab.), Islington East.
Sir George Berry (C.), Scottish Universities.
Sir John Rose Bradford (C.)
Dr. F. G. Bushnell (Lab.) } University of London.
Dr. E. G. Graham Little (Ind.)
*Dr. W. A. Chapple (L.), Dumfries.
Dr. Stella Churchill (Lab.), Hackney North.
Dr. R. Dunstan (Communist), Birmingham West.
*Dr. Walter E. Elliot (C.), Glasgow, Kelvingrove.
*Dr. F. E. Fremantle (C.), St. Albans.
Dr. O. Gleeson (L.), Portsmouth North.
*Dr. L. Haden Guest (Lab.), Southwark North.
*Mr. Somerville Hastings (Lab.), Reading.
Sir Henry Jackson (C.), Wandsworth Central.
Sir Richard Luce (C.), Derby.
Dr. J. J. Lynch (Ind. Lab.), Walsall.
Dr. I. H. MacIver (Lab.), Argyll.
Dr. R. O. Moon (L.), Oxford.
Dr. H. B. Morgan (Lab.), Camberwell North-West.
Dr. Joseph Robinson (Lab.), Stretford.
Dr. A. Salter (Lab.), Bermondsey West.
Dr. Laura Sandeman (C.), Aberdeen North.
*Dr. G. E. Spero (L.), Stoke Newington.
Dr. T. Watts (C.), Manchester, Withington.
*Dr. J. H. Williams (Lab.), Llanelly.
*Lieut.-Colonel T. S. Beauchamp Williams (Lab.), Lambeth, Kennington.

Candidates who sat in the recent Parliament are indicated by an asterisk.

Professor Thomas Sinclair (C.), the representative of Queen's University, Belfast, in the last Parliament, has been returned unopposed.

THE OLYMPIA MOTOR SHOW.

CONCLUDING REVIEW FROM THE MEDICAL MAN'S STANDPOINT.

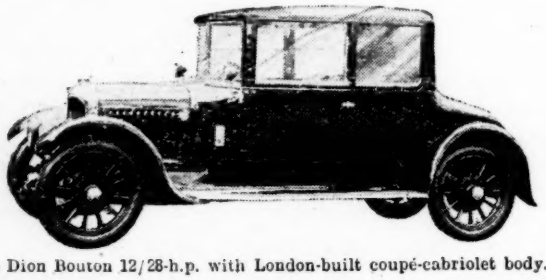
BY

H. MASSAC BUIST.

The eighteenth yearly International Motor Car Show, which closes at Olympia, Kensington, at 10 o'clock on Saturday night, must be pronounced by far the greatest of the series, and the one which has made the most striking appeal to the medical motorist. It contains even promise of better things to come. Thus the very largely used system of grease-gun lubrication for the chassis, which revolutionizes the vexed problem of proper yet easy maintenance, may in a year or so be further simplified by the use of a new material, the Belflex-Hobson fabric spring-shackle engine and torque arm mountings. This means that spring-shackles—one of the most frequently neglected parts of a vehicle from the point of view of lubricant, and a great source of squeaking—can be replaced by what is really a development and adaptation of the principle of the Hardy universal fabric joint, which is a cheap and successful substitute for one of the most expensive and complex, as well as the hardest worked, pieces of a car mechanism—namely, the universal joints at either end of the propeller shaft. Belflex material comes from America, but is as yet no further advanced in general application there than it is here, though we shall certainly hear more of it in twelve months' time. By the use of this material for such parts as shackles, and so on, it would not be necessary to supply them with lubricant.

Coachwork.

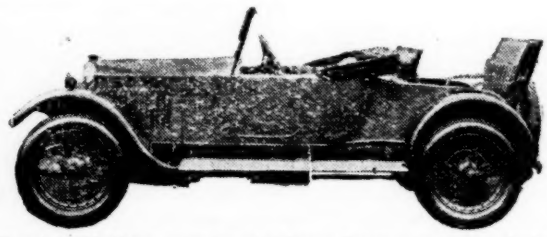
De Dion Bouton, as stated last week, introduces this year, on a 12/28-h.p. four wheel brakes chassis, an "occasional



De Dion Bouton 12/28-h.p. with London-built coupé-cabriolet body.

four" coupé type of good interior illumination and notably easy access. The seat beside the driver is tilted forward when it is desired to enter, or to leave, the rear collapsible seats, which are accommodated very neatly when not in service. Regarding cars standardized with complete equipment in the form of four- or five-seat open-work bodies, it is to be noted that a great number are provided now with rear windscreens, also that most of these devices enable the screen to be thrust sideways to give convenient entrance to the car when the screen is in use. The Humber curtaining scheme on the all-weather type of body is one of the neatest hitherto designed—alike from the points of view of erecting it in a moment and of stowing it quite out of sight and most conveniently when not in use. It can be stated that the all-weather curtaining schemes on most cars really afford adequate protection, together with the provision of good visibility for safe driving. Further, convenient driving is assisted greatly by the fact that this year a very large number of makers, particularly of cars of limited chassis space, nevertheless contrive to provide independently adjustable front seats to accommodate the particular requirements as to leg length, and so forth, of the individual occupants; yet many of these devices are of types that do not develop rattle with wear. Quite extraordinary things are being done in the matter of coachwork at really cheap prices—for instance, the new four-seat open touring all-weather British-built bodies on the Citroën chassis.

The most notable entirely new contribution from abroad to the problem of the small scale car is provided by Citroën on a 11.4-h.p. four-cylinder engined chassis. This maker has arrived at the conclusion that steel, instead of wood, should be used for the bodies. His new car is a four-seat saloon body on a 11.4-h.p. 1,453 c.cm. four-cylinder engined chassis; one advantage of the steel body is that it gives proportionately a greater range of vision to driver and to passengers because the posts are the smallest ever devised. Other gains of this construction are the lightness without

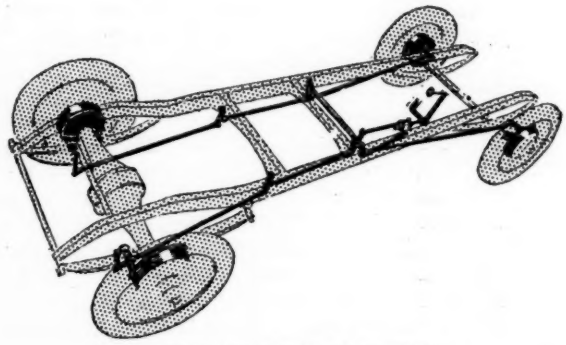


Vauxhall 14/40-h.p. with special Mann Egerton two-seater body.

sacrifice of strength, freedom from distortion and rattle, and the quality of being fireproof. This four-seater, as exhibited, is sold retail at £325. The Citroën works are now producing 300 cars a day, which is a record for the European industry and an explanation of the low scale prices ruling this year. As mentioned in these columns a month ago, Citroën was the first big scale maker to standardize balloon tyres on all his models, to the great improvement of their riding qualities.

This system is in striking contrast with the flexible, non-rigid fabric Weymann method of construction, which could have been evolved to solve the problems of squeak and distortion only through applying aircraft engineering practice. This type of covered body is listed as an alternative by a number of chassis builders. Its use is for the permanently covered type of coachwork, and it is available in that form even on so small a machine as the 8-h.p. two-cylinder air-cooled engined Rover. The Weymann body is manufactured under licence by Singer among many others. Singer uses detachable pneumatic upholstery. Wolseley, Lancia, and Singer show new-style fabric body materials that are really British in conception, whereas the original fabric body patterns were not.

Of bodies built to special design there is a clever provision of what one might style a "semi-coupé" in the Mann Egerton blue granite two-seater, with commodious and comfortable dickey seat, provided on a 14/40-h.p. developed four-speed right-hand controlled Vauxhall chassis, the trimmings being blue antique leather. The body panels are done in aluminium, and are equipped with quick operating hood fittings, together with all-weather side curtains that open and close with the doors; the price of the car complete is £650. This type of body can be



The Austin four wheel braking system.

built broader at an inclusive price of £200. The S. F. Edge patented "open-closed" compact light-weight body that is usable either as a two-three seat open touring car or as a coupé type is clever, the six-cylinder chassis being available now with longer wheel-base, also with a four wheel braking system. The Austin four wheel braking system, illustrated above, is so arranged that the

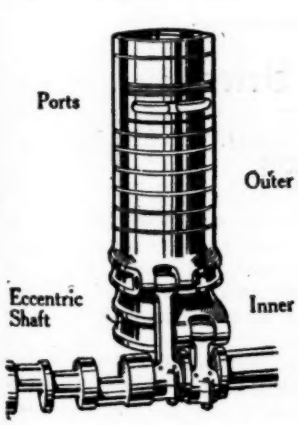
pedal action applies braking action to all four wheels in synchronism, with suitable compensating mechanism, provision being made for quick and easy adjustment. A rod connects the pedal with the brake-operating cross-member, the actual connexion to each wheel being by a cable.

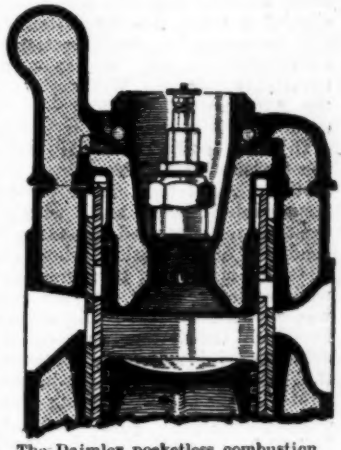
HINTS TO USERS OF "BALLOON" TYRES.

The increasing use of shock-absorbers, combined with the employment of low pressure tyres, serves as an intermediate makeshift measure in dealing with the problems of suspension. It may be stated broadly that a happy compromise is being reached, though in connexion with the low pressure tyre it is to be observed that Minerva and Willys-Knight use a semi-balloon tyre, as do some others. On the large heavier car constructions the semi-balloon tyre does not tend to drag at the corners. Regarding this development, Lieut.-Colonel Sealy Clarke, President of the Society of Motor Manufacturers and Traders, uttered a useful warning in the *Motor* concerning the manner of obtaining the best results from low pressure pneumatics. This type needs to be watched more carefully to see that it is at the correct pressure than does an ordinary tyre, otherwise undue cost for damaged tubes and wall wear will follow. For instance, with a normal tyre run at a pressure of 65 lb. to the square inch, it matters relatively little that it is being run at 60 or even 55 lb.; whereas the loss of 5 lb. in a balloon tyre inflated at 25 lb. per square inch will alter the character of its riding altogether, as also the strains imposed on it, as well as its behaviour at corners, and so on. It is not possible to forecast at present what wearing life can be expected of balloon tyres, because the only statistics available are those by experts. Data are needed concerning what happens in the hands of the inexpert—otherwise the general public. There is no reason to anticipate a shorter wearing life than with normal section tyres, provided attention is given to correct inflation. In any case the use of the balloon tyres in cars of poor suspension, or with relatively weak springs, should result in economy in shackles, wear, and so forth. But all tyre companies rightly stress the need continually to make sure that one is not driving with such pneumatics underinflated. The consensus of expert opinion at the moment is that any underinflation beyond 10 per cent. spells actual danger. The Goodyear company states that balloon tyres are for comfort, not "stunting"; therefore nothing could be more foolish than to drive over the edge of a curb or similar obstruction with a car shod with low pressure tyres, because the shock to the thin walls may cause irreparable damage.

DOUBLE SLEEVE VALVE ENGINE DEVELOPMENTS.

It is more than half a generation since an American, who knew nothing whatever about engineering, Mr. Charles Y. Knight, discovered how to make a liquid fuel internal combustion engine which would function silently because, instead of having poppet valves, he inserted two sliding sleeves, with slots in them, in the cylinders. The principle was tried in America, but nobody could make a success of it. The invention was then brought to Sir Edward Manville, chairman of the Daimler Company in this country, and Mr. Percy Martin experimented with it. At first engineers said it was impossible because the sleeves could not be lubricated. But a natural law, as distinct from man's ingenuity, looked after that automatically: the sleeves lubricated themselves by capillary attraction. In the issue it was found that this was —and it remains—the only type of motor car engine which works best in the natural condition of a gas engine—namely, when the sleeves are dirty; for example, gas-tight with lubricant. As soon as the type was made successfully the Daimler Company pioneered its introduction to the public by putting it to a week's test on the bench, and the challenge issued by the company at the conclusion of that successful test still remains to be taken up. Silent-acting valve gear on motor cars in general dates from, and is a consequence of, the introduction of that engine, which has been taken up under licence by Mercédès in Germany, by Panhard in France, by Minerva in Belgium, and by Willys-Knight in America. To-day, among other firms exploiting the type, is Voisin, the aeroplane builder, who now makes cars. The licencees pool their improvements. For a long time the sleeves were made of cast iron. Much of the improvement in the performance of these engines is due to the more recent use of steel sleeves. In the beginning, too, the cylinders were cast in pairs; now most of the licencees make monobloc engines, even as are the poppet valve types, with the result that much better rigidity is gained. It was in connexion with this engine that Professor F. W. Lanchester evolved his harmonic balancing gear for dealing with secondary inertia forces in the crank case. Even the American version of this engine, made by Willys-Knight, has been improved greatly in performance this year by altering the position of the valve ports and by applying this Lanchester harmonic balancing gear. The American types have four cylinders only, and therefore need it even more than do the six-cylinder types, which are the more generally favoured system in Europe. These engines are to-day standardized with much higher compressions. They are supplied to the King's four new cars that replace the machines with the same sort of engine which his Majesty has had in use for thirteen and fourteen years respectively.





The Daimler pocketless combustion chamber.

ROYAL COMMISSION ON LUNACY AND MENTAL DISORDER.

(*Continued from page 725.*)

THE sittings of the Royal Commission on Lunacy and Mental Disorder were resumed on October 21st, the Right Hon. HUGH P. MACMILLAN, K.C., presiding.

Sir CLAUDE SCHUSTER, permanent secretary to the Lord Chancellor, desired to amplify an answer which he gave at the previous hearing when he said that he hoped a lunatic in confinement did not possess or would not be given the right to demand a public inquiry as to whether he had recovered. He explained that he held this opinion because (1) lunacy was a disease whose cure or alleviation was a gradual process, and the determination whether the patient had reached a point at which he might properly be released was a matter peculiarly unsuited for public inquiry; (2) the function of those who had to determine whether the patient was to be released or further detained was not to investigate any charge against a patient as if he were an alleged criminal, and it would be very undesirable that the local authority or the person in charge of the asylum should be forced into an office analogous to that of prosecutor; and (3) a very large proportion of lunatics considered that they were wrongfully detained, and every one of these people would have the right to demand an inquiry; a lunatic's condition was unsuitable for public discussion, and the details would be often unpleasant and sometimes humiliating for the patient, and detrimental to his interests.

Evidence of the Ministry of Health.

Mr. L. G. BROCK, Assistant Secretary of the Ministry of Health, described how certain powers and duties with regard to insane persons had been transferred from the Local Government

Board and the Home Office to the Ministry of Health. These powers and duties might be grouped broadly under four heads: (1) the limited powers of the Ministry with regard to the individual lunatic (the Minister could not order discharge, but he could institute inquiries on complaint); (2) approval of plans of local authorities and visiting committees for the purchase of land and erection of buildings; (3) certain powers relating to the Board of Control, concerning the Ministry's voice in some appointments to and by that Board, and responsibility for the Board's estimates in Parliament (the Ministry had no power to give directions to the Board for any specific administrative act, but as a matter of practice the Board invariably met the Minister's wishes); (4) its power to direct the Attorney-General to prosecute any person alleged to have committed a misdemeanour under the Act.

In reply to the chair, Mr. Brock described the daily work of the division of the Ministry which dealt with lunacy administration. All letters from patients were carefully read by a responsible officer, and, whenever necessary, the Board of Control was consulted regarding the latest medical report on the condition of the patient whose case was the subject of a letter. This did not apply, of course, to a number of chronic patients, who wrote regularly, for the mental condition of these people was well known to the department, and there were other cases in which the letters bore on the face of them unmistakable evidence of insanity; a frequent complaint from patients was that they were being "poisoned by wireless"; one patient wrote that he was "having communism injected into him by psycho-analysis." Apart from these and similar exceptions, however, the most careful attention was given to every letter, and the Board of Control, if it had no recent report on the case available, obtained a special report, at the Ministry's request, on any case in which there was an allegation of wrongful detention or ill treatment. When there was still room for doubt the Ministry asked that the Commissioners at their next visitation should pay special attention to the patient. If a case presented medical as distinct from psychiatric issues which called for investigation, a medical officer of the Ministry was sent to report upon it. In only one case of recent years had it been found necessary to resort to an independent inquiry.

Mr. Brock went on to say that the evidence available to the Ministry did not suggest that persons were improperly certified or detained longer than the medical superintendent believed to be necessary, nor had any allegations of ill treatment been fully substantiated. At the same time it was clear that there were a number of patients in mental hospitals who, though in no sense sane, could be discharged without danger to themselves or the community if their relatives were willing and able to look after them. The exact point at which a person suffering from mental disorder was sufficiently recovered to justify discharge was necessarily a matter of opinion; and some superintendents, mindful of the risks they incurred by recommending discharge prematurely, were more cautious than others. It was also remarkable that in many instances where the relatives were convinced that the case was one of improper detention the medical report indicated a definitely bad prognosis. The explanation might be that in certain forms of insanity which were slow in development there were periods of quiescence, and as the relatives were only allowed to see the patient on good days, they formed an incorrect impression of his mental condition. Other cases developed acute symptoms at an early stage, and, though the prognosis was hopeful, the relatives, having seen the patient violent or raving before removal to the asylum, had no doubt as to his insanity and not much hope of his recovery.

Sir Humphry Rolleston asked what were the advantages of having the Board of Control as a separate authority, instead of an ordinary department of the Ministry. Mr. Brock said that he would prefer not to express any opinion on such a large matter of policy. At present the relations between the medical Commissioners of the Board and the medical officers of the Ministry depended upon mutual courtesy and a regard for administrative convenience.

Administration of the Poor Law in relation to Lunatics.

Mr. H. W. S. Francis, assistant secretary of the Poor Law Division of the Ministry of Health, gave evidence as to the functions of the Ministry as the successor of the Local Government Board in the administration of the Poor Law. His department kept in close touch with the administration of the local Poor Law authorities through a body of general inspectors, and medical officers, and every Poor Law institution was visited at least once a year. The general inspectors had a statutory power of holding inquiries upon oath. During the last five years such formal inquiries had been held in two cases in which persons of unsound mind were concerned. In one case a representative of the Board of Control sat as assessor. There had been other cases in which, after considering the report of the inquiry made by the Poor Law authority concerned and the action taken, it had seemed unnecessary that a departmental inquiry should be held. The witness went on to give some statistics. On January 1st there were 1,372,098 persons in receipt of Poor Law relief, of whom 125,972 were receiving relief on account of lunacy or other mental infirmity (93,783 in lunatic asylums, where their care was mainly the responsibility of the asylum authorities and the Board of Control, 4,757 in receipt of outdoor relief, and 27,432 in Poor Law institutions or institutions, other than asylums, maintained wholly or partly out of the poor rate). Of these 27,432 persons, 8,763 were inmates of Poor Law institutions provided solely for mental cases, and almost all the remainder were inmates of the sick or other wards of ordinary Poor Law institutions.

Duties of Relieving Officer under the Lunacy Acts.

The next witness was Mr. E. J. Lidbetter, President of the National Association of Relieving Officers, who, on behalf of the body he represented, made a number of recommendations. The first of these was that there should be no difference in the process of certification between the pauper and the non-pauper case. Juveniles—by which he meant persons under 16 who were imbeciles or idiots—should not, except in very rare cases, be certified as insane, nor should cases of senile dementia. The provisions of the Mental Deficiency Act should be amended to enable juvenile pauper cases to be dealt with under its provisions. He thought also that the Board of Control or some other authority or commission should be endowed with powers to determine under proper safeguards ambiguities in the statutes and points of law involved, and he described to the Commission some of the difficulties which relieving officers encountered—difficulties in many cases only to be got over by evasions of the law in the interests of the patient and the public.

The chief recommendation of the witness, however, was that the workhouse should no longer be regarded as a place of safety for alleged lunatics, but Asylums Committees should be required to provide sufficient reception houses in all urban areas. In such centres there would be sufficient cases to justify and require a rota of justices holding a daily session. The preliminary period of detention need not then be as long as three days. Such daily centres would be more formal and would conduct the investigation of cases in a more judicial atmosphere than was possible in the wards of a workhouse. There would be a resident medical officer available at these reception houses for the purpose both of observation and treatment. The reception house should also serve the purpose of a clinic for the provision, under proper circumstances, of advice and treatment to out-patients. On a recommendation for the discharge of a patient from an institution for lunatics the staff of the reception house would inquire into and report upon the conditions into which it was proposed to release the patient, and, on his release, would make some provision for after-care.

The Chairman said that the Commission was anxious to recommend the best provision possible, but he rather feared that the expense of such a scheme might be an objection. He quite saw the importance of the proposal, but it was necessary to cut the coat to suit the cloth.

Mr. Lidbetter admitted that some of the branches of his own organization were not in favour of the scheme owing to its probable expenditure. But he thought that the expenditure might not be as great as was anticipated, especially in view of the workhouse accommodation, in London at all events, now available for other than ordinary use.

Nova et Vetera.

THE MEDICAL KNOWLEDGE OF CHARLES DICKENS.

Mrs. Gargery's Illness.

Many will recall passages from the works of Dickens in which he displays a familiarity with matters pertaining to medicine. When his characters suffer, through illness or accident, he describes their symptoms with great minuteness, and in the case to which I wish particularly to refer he also shows great accuracy.

Those who have read *Great Expectations* will remember the dastardly attack on Mrs. Joe Gargery, the wife of the village blacksmith, who was struck on the back of the head and on the spine by an unknown hand. The incident is described at the end of Chapter 15 and in Chapter 16.

The immediate symptoms from which Mrs. Gargery suffered, and more especially those which were evident later, are of interest in revealing the extent of medical knowledge possessed by Dickens. Further, this keen observer, in his description of the later symptoms, has anticipated by

some years, as shall be shown, the findings of our great neurologists.

Let us first, then, consider the story of the assault, and the description of the symptoms which followed, as Dickens has it.

"I became aware of my sister, lying without sense or movement on the bare boards, where she had been knocked down by a tremendous blow on the back of the head, dealt by some unknown hand when her face was turned towards the fire. . . .

"She had been struck with something blunt and heavy, on the head and spine; after the blows were dealt, something heavy had been thrown down at her with considerable violence as she lay on her face. And on the ground beside her . . . was a convict's leg-iron, which had been filed asunder."

Such an instrument would give a depressed fracture, and the "tremendous blow" would cause widespread damage to the posterior portion of the brain. The next symptoms to be mentioned occur after some lapse of time.

"Long after these constitutional powers [the constables and Bow Street men] had dispersed, my sister lay very ill in bed. Her sight was disturbed, so that she saw objects multiplied, and grasped at visionary tea-cups and wine-glasses, instead of the realities; her hearing was also greatly impaired; her memory also; and her speech was unintelligible. When, at last, she came round so far as to be helped downstairs, it was still necessary to keep my slate always by her, that she might indicate in writing what she could not indicate in speech. As she was (very bad handwriting apart) a more than indifferent speller, and as Joe was a more than indifferent reader, extraordinary complications arose between them, which I was always called in to solve. The administration of mutton for medicine, the substitution of Tea for Joe, and the baker for bacon, were among the mildest of my own mistakes. However, her temper was greatly improved, and she was patient. A tremulous uncertainty of the action of all her limbs soon became a part of her regular state, and afterwards, at intervals of two or three months, she would put her hands to her head, and would then remain for about a week at a time in some gloomy aberration of mind. . . .

"It may have been about a month after my sister's reappearance in the kitchen, when Biddy came to us. . . . Biddy's first triumph in her new office [that of attendant on Mrs. Gargery] was to solve a difficulty that had completely vanquished me. . . . Thus it was: Again and again and again, my sister had traced upon the slate a character that looked like a curious T, and then with the utmost eagerness had called our attention to it as something she particularly wanted. I had in vain tried everything producible that began with a T, from tar to toast and tub. At length it had come into my head that the sign looked like a hammer, and on my lustily calling that word in my sister's ear, she had begun to hammer on the table, and had expressed a qualified assent. Thereupon, I had brought in all our hammers, one after another, but without avail. Then I bethought me of a crutch, the shape being much the same . . . but she shook her head.

"When my sister found that Biddy was very quick to understand her, this mysterious sign reappeared on the slate. Biddy looked thoughtfully at it . . . looked thoughtfully at Joe (who was always represented on the slate by his initial letter), and ran into the forge. . . . 'Why, of course!' cried Biddy, with an exultant face. 'Don't you see? It's *him*!' Orlick, without a doubt! She had lost his name and could only signify him by his hammer. . . . I confess that I expected my sister to denounce him. . . . She manifested the greatest anxiety to be on good terms with him, was evidently much pleased by his being at length produced, and motioned that she would have him given something to drink."

Later, towards the end of Chapter 18, we have another glimpse of our patient.

"Infinite pains were taken by Biddy to convey to my sister some idea of what had happened [that is, that Pip had now great expectations]. To the best of my belief, those efforts entirely failed. She laughed and nodded her head a great many times, and even repeated after Biddy the words, 'Pip' and 'Property.' But I doubt if they had more meaning in them than an election cry, and I cannot suggest a darker picture of her state of mind."

Again we see the household at supper, with Biddy sitting "holding my sister's plate," and towards the end of Chapter 19 we find Mrs. Gargery "laughing and nodding and shaking in her usual chair."

Some time afterwards—it would be difficult to state exactly how long—Pip has news of the death of his sister. After the funeral he has a talk with Biddy.

"'I have not heard the particulars of my sister's death, Biddy.'" She replies, "'They are very slight, poor thing. She had been in one of her bad states—though they had got better of late rather than worse—for four days, when she came out of it in the evening, just at tea-time, and said quite plainly, "Joe." . . . She made signs to me that she wanted him to sit down close to her . . . and so she presently said, "Joe" again, and once "Pardon," and once "Pip." And so she never lifted her head up any more. . . .'"

Such, then, is the account of Mrs. Gargery's illness, caused by a blow from a blunt heavy instrument "on the back of the head," described again as "on the head and spine"; let us examine in detail the symptoms which she showed, and see how far they coincide with our present knowledge of cortical lesions. The immediate symptoms following the blow are those of cerebral concussion: "I became aware of my sister lying without sense or movement." The later symptoms are those of disturbance of vision. Now, a blow on the back of the head would involve the occipital and parietal regions. A cortical lesion of the occipital region would account for her disturbance of sight. A lesion of the parietal region, especially of the postero-parietal, produces psycho-visual symptoms, such as loss of visual localization in space, disturbance of the perception of depth and distance. Such a patient, although able to see objects distinctly, cannot tell how far removed they are from herself or from each other. (Purves Stewart.) Such a patient would put out her hand and grasp the air in an attempt to grasp a cup, giving the impression to an onlooker that she saw objects multiplied.

The impairment of hearing and memory and the unintelligible speech are symptoms of auditory aphasia. A blow on the back of the head, of a force so violent, would in all probability injure the temporal lobe. A lesion of this area would account for these symptoms (cortical word-deafness), and also for many others which are mentioned—such as the patient's ability to indicate in writing what she could not indicate in speech, and also the mistakes in spelling, though she was a more than indifferent speller prior to her injury. With a lesion in this region the patient is unable to understand what is said to him; his hearing is therefore apparently impaired. Internal speech and thought are also impaired, and so the patient makes mistakes in writing, especially in spelling. He talks fluently enough, it is true, but he tends to mix up words and syllables, and in a severe case may jabber unintelligible jargon. (Purves Stewart.) Mrs. Gargery was a severe case.

Sensory aphasia—comprising auditory aphasia and visual aphasia—was connected by Wernicke with the existence of lesions in a fairly wide area, including the supramarginal and angular gyri and the hinder portions of the first and second temporo-sphenoidal convolutions. In these cases there may be limited power of speech, but there is serious impairment of the intelligence, and especially of the power of appreciation of spoken words, so that the patient does not understand what is said to him. This condition may or may not be attended with alexia—loss of power to read. (Starling.)

It has been shown that Mrs. Gargery had auditory aphasia; that there was conjointly visual aphasia is also evident, the lesion involving the angular gyrus. The patient could not comprehend written words, hence the difficulty experienced by her friends in making themselves understood. The lesion of the visual word centre was, however, only partial, for she had not complete agraphia, but was able to write spontaneously a little, but put wrong words or letters—so-called paragraphia.

That she had loss of the memories of some written words was revealed by her inability to summon Orlick, the blacksmith's assistant, to come before her. She knew exactly who she wanted, yet could not write the required word, but signified him only by tracing a character to represent his hammer.

Now it was Orlick who committed the assault, yet Mrs. Gargery is pleased to see him. As the blows were struck from behind, it must be supposed that the victim never saw her assailant; at any rate she did not now associate him with any terrible memory. On the other hand, it may be that we here have evidence of "retrograde amnesia"—that is, no recollection of the incidents which occurred within the last few hours immediately prior to the assault. Such a condition of forgetfulness is generally to be found in patients severely concussed.

The description of Mrs. Gargery "in her usual chair" would point to some form of paralysis of the lower limbs. Injury to the spinal cord, the result of blows upon the cervical region of the spine, would be the causal factor.

Let us now finally turn to the account of the death of the blacksmith's wife. "She had been in one of her bad states . . . for four days"; and then "she came out of it in the evening. . . ." This "bad state" probably refers to the condition of the patient already described, in which "she would often put her hands to her head, and would

remain for about a week at a time in some gloomy aberration of mind." Mrs. Gargery before her injury is described as being a person of great irritability of temper, easily provoked, and subject to fits of most violent passion. "She's been on the Rampage, this last spell, about five minutes," said Joe; while Pip writes, "She concluded by throwing me—I often served her as a connubial missile—at Joe"; and later, "She pounced on Joe, and, taking him by the two whiskers, knocked his head for a little while against the wall behind him."

In a person of so violent a temper cerebral concussion would most likely be followed by symptoms of concussion neurosis, and also katatonic stupor, as mentioned by Purves Stewart; and, indeed, to such conditions does the above description of the "bad state" point. The tremors which are often a marked feature of these traumatic neuroses are also mentioned to complete the clinical picture—"A tremulous uncertainty of the action of all her limbs soon became a part of her regular state"; while the glimpse of Biddy holding the patient's plate for her at supper reveals this "tremulous uncertainty." That the patient's temper should have become improved as a result of the concussion is, however, an exception to the rule.

In the light of our modern knowledge, does not this account of Mrs. Joe Gargery's illness, the result of a widespread lesion of the posterior aspect of the brain, reveal Dickens to be a most wonderfully minute and accurate clinical observer? He would not realize the significance of his observations from a scientific medical standpoint, but the fact remains that he has described nothing that is not in keeping with present neurological knowledge. His information could not have been obtained from medical friends or from medical literature, as will be shown; he must have gained it purely by his own observation.

Great Expectations was written in 1861. What was the existing knowledge of the functions of the cerebral hemispheres at this time? It was known to Galen that the occurrence of paralysis on one side of the body was the result of lesions in the brain of the opposite side. The theory that the functions of the brain can be localized in the cerebral cortex was introduced in somewhat fantastic form by Franz Joseph Gall as organology or cranioscopy, and by his pupil Spurzheim as phrenology; their joint researches appeared as a four-volume treatise with atlas (1810-19). Flourens in 1822-24 made his observations on the effects of removing the cerebrum and cerebellum in pigeons, showing the absolute maintenance of reflexes with loss of cerebration and volition in the former case and disturbance of equilibrium in the latter. In 1828 he located the existence of true cerebellar and labyrinthine vertigo. (Garrison.)

In the same year as *Great Expectations* appeared Broca, confirming older statements by Dax and by Bouillaud (1825), maintained that aphasia, when it occurred in right-handed people, was always associated with a lesion of the third frontal convolution of the left hemisphere. In 1836 Richard Bright had described localized epileptiform spasms from definite cerebral lesions, to be confirmed later (1864) by Hughlings Jackson. Such, then, was the knowledge existing in 1861 upon the subject of localization of function of the brain. It was some years afterwards (1865-72) that Meynert made his investigations on the anatomy and physiology of the brain. He pointed out, on anatomical grounds, that the posterior portions of the hemispheres were probably more nearly connected with sensation, and the anterior with the power of movement. Sir David Ferrier (1872-76) described the localization of sensory functions in the cortex, and in 1874 Wernicke described sensory aphasia, including alexia and agraphia. In 1876 Flechsig mapped out the special motor and sensory, as well as the "silent," or inexcitable, areas in the cerebral cortex. (Garrison.)

Thus it will be seen that Dickens, in his account of Mrs. Joe Gargery's illness, must have described a case which he had actually met with in life and observed himself. The extreme accuracy of the description shows him to have been possessed of powers of medical observation far in advance of the clinicians of his day.

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Scotland.

VITAL STATISTICS OF SCOTLAND.

THE Scottish Registrar-General's Report for the year 1923 has now been issued.[1] It contains the usual detailed and well arranged information as to births, marriages, and deaths in the country as a whole, in the largest cities and towns, and in the public health districts of the counties. Some of the main facts relating to the whole of Scotland are as follows:

The population at the middle of the year is estimated at 4,901,100. Owing to large emigration, there is a reduction of 3,356 as compared with the previous year, though the total is 18,603 more than in the census year 1921. The births were 111,902, or at the rate of 22.83 per 1,000 of population, this being the lowest rate since registration began in 1855, excepting the three years 1917, 1918, and 1919. Expressed per 1,000 of women of the child-bearing age, 15 to 45 (married and unmarried), the birth rate was 93.8, or 2.6 less than in the previous year. The illegitimate births were only 6.68 per cent. of the total births, this also being the lowest recorded. Illegitimacy varied remarkably as between different parts of Scotland, it being specially high in the counties (including the burghs) of Wigtown and Kirkcudbright in the south-west, and also in the north-eastern counties—Aberdeen and those on the Moray Firth. In the industrial region—Lanark, Renfrew, Dumbarton, etc.—it was very low. The marriage rate for Scotland was 7.19 per 1,000, being rather higher than in 1922, but lower than in the preceding five and ten years.

Infant Mortality.—The infant mortality rate was only 78.8 per 1,000 births, this being very decidedly the lowest on record, the previous minimum having been 90.3 in 1921. This year's rate is 18.1 per cent. less than the mean of the preceding five years, and 24.7 per cent. less than that of the preceding ten years—a notable and gratifying reduction. In the counties, including the burghs, the rate ranged from 36 in Shetland to 101 in Banff.

Cancer.—Among the causes of death more than usually prevalent was cancer. Its deaths were 6,376, or 790 in excess of a ten-yearly mean. Stated per 100,000 of population the rate was 130. Fifty years ago, in 1873, deaths from phthisis outnumbered those from cancer by 6,749, or nearly 440 per cent., but cancer deaths now outnumber phthisis by 2,380, or 60 per cent. The cancer death rate in males in 1923 was 118 per 100,000, and in females 142, the former being 7 and the latter 4 more than in the previous year. Of the total 6,376 deaths from malignant disease, 4,377 were ascribed to carcinoma, 276 to sarcoma, and 1,723 to other or unspecified forms.

Tuberculosis.—The death rate from all forms of tuberculosis in 1923 was 118 per 100,000, and is the third consecutive annual rate of less than 120, and the fifth less than 140. The deaths in 1923 were 5,790; in 1870 (in a much smaller population) they were 13,027, or 404 per 100,000. Of the total 5,790 tuberculosis deaths in 1923, there were attributed to the respiratory system 3,996, to tuberculous meningitis 664, to tuberculosis of the intestines and peritoneum 521, of the spine 97, of the joints 53, whilst 459 others included 138 acute and 171 chronic disseminated tuberculosis. The skin accounted for 12, the bones (except spine) 23, the lymphatic glands other than abdominal 20, and the genito-urinary system 55.

Principal Causes of Death.—A table of the relative frequency of causes of death in 1923 states every cause which produced more than 1 per cent. of the total. Heart disease accounted for 10.90 per cent., malignant tumours 10.08, apoplexy 9.13, pneumonia 7.39, diseases of early infancy and malformations 6.72, tuberculosis of the respiratory system 6.31, bronchitis 5.65, violence 3.90, nephritis, acute and chronic, 2.84, measles 1.77, whooping-cough 1.56, diseases of the respiratory system other than tuberculosis, bronchitis, and pneumonia, 1.33, diseases of arteries 1.27, diarrhoea and enteritis (under 2 years) 1.25, and tuberculous meningitis 1.05. This list includes 71.2 per cent. of the total deaths. In 1922 a severe epidemic of influenza caused 5.08 per cent. of the total deaths, but in 1923 the percentage was only 0.84. Deaths from pneumonia and bronchitis also contributed a smaller percentage of the total than in 1922, and thus helped to raise the relative percentages of deaths from other causes.

Vaccination.—The annual report on this subject relates to 1922, not 1923. Of 115,085 children born, 8,168 died before reaching the statutory vaccination age of 6 months. Of the remainder, 62.10 per cent. were certified as successfully

[1] H.M. Stationery Office, 120, George Street, Edinburgh, and at H.M. Stationery Offices in England and Wales. (Roy. 8vo, pp. cxxix + 155. 10s. 6d. net; 10s. 10d. post free.)

vaccinated or reported to be insusceptible owing to previous uncertified vaccination; 983, or 0.92 per cent., were returned as insusceptible for other reasons; and 36.98 per cent. were reported unvaccinated, of whom 33,224 had been the subject of declaration of conscientious objection. The percentage successfully vaccinated is 0.36 less than in 1921, and is also less than in 1920, but is greater than among children registered in each of the years 1913 to 1919. It will be noted that the percentage vaccinated, being over 62, is much higher than in England, which is under 40. Previous to the Act of 1907 more than 91 per cent. of the surviving births were vaccinated.

Royal Medical Society of Edinburgh.

The 188th session of the Royal Medical Society was inaugurated on October 17th by an address from Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S.; Dr. A. B. Williamson, senior president of the society, presided over a large attendance. The lecturer took as his subject "Thoughts on medical discovery," and said that a very brief study of civilization showed that new discoveries constituted a rare phenomenon which tended to be localized both in time and place. The Graeco-Roman period of discovery had lasted about nine centuries, and thereafter a long negative period ensued for about eleven or twelve centuries, during which hardly any advance had been made. Then suddenly, in the fourteenth and fifteenth centuries, a period of rebirth had begun almost simultaneously in every line, including art, literature, science, exploration, and philosophy. A theory had been advanced by Sir Flinders Petrie that the cause of these periodic augmentations of intellectual vigour lay in the admixture of races from time to time by permeation or conquest. Some centuries after admixture with a foreign race the vigour of a people began to increase, and arts and sciences were discovered or rediscovered; then gradually came regression and decay until subsequent infusions or conquests occurred. It was unlikely that at any given time all the world's nations should be in the same state of development. It might be said that to-day India and China were in the slack state as compared with Europe, and that Europe was approaching the slack state as compared with America. The lecturer added that new discoveries in medical science were scanty in comparison with the large numbers engaged in this pursuit, but the same thing applied to all other departments of life. Medical discovery was to human beings the most important of all kinds of discovery, and the amount of public attention given to it was disproportionately small. The total amount provided for research every year in this country was probably only £180,000, which was equivalent to 1d. per annum for each person in Great Britain. For this penny everyone hoped to have his life prolonged! Eighty years ago the average expectation of life in London was under forty years, but it had been prolonged until it was now sixty years, and he saw no reason why the average expectation of life should not be prolonged to the seventy years of the Psalmist. He had often wondered what would be the length of life if an individual were kept entirely free from pathogenic organisms and deleterious foods and drinks. It was not known why elephants, parrots, and tortoises should live for more than a century while horses and dogs died before twenty years of age; this, too, might be a subject for research. The nation had to pay millions of pounds for its protection from foot-and-mouth disease largely owing to the fact that it refused to pay small sums for the investigation of the disease. Doctors and men of science might congratulate themselves personally on the fact that almost all the discoveries that had been made were made by them without help from anyone else, at the expense of the investigators themselves; but the world would be well advised to spend much more than it was now doing on investigating how diseases of all kinds might be fought.

Regius Chair of Surgery in Glasgow University.

Professor Archibald Young, M.D., the new Regius Professor of Surgery in Glasgow, in his inaugural lecture on October 13th, dealt with the history and progress of surgery in Glasgow, with special reference to his predecessors in office. Since the Regius Chair was founded, in 1815, there had been five previous occupants, all distinguished; each had helped to establish the high credit of surgery and of surgical teaching in Glasgow and in Scotland. He gave a brief account of their achievements, referring more particularly to the epoch-making work of Lister and Macewen. He pointed out the great traditions to which he and all medical students in Glasgow University were heirs, and which it would be their duty and privilege to honour and maintain. Professor Young concluded by referring to one great need of the Glasgow School of Surgery—a properly equipped surgical museum—and made a strong appeal for help in the founding and equipping of such a collection.

Sir Malcolm Watson's Lectures in Glasgow.

A series of lectures was given during last week in the University of Glasgow by Sir Malcolm Watson, M.D., LL.D., on antimosquito work in the tropics. Principal Sir Donald MacAlister presided over large and interested audiences. The lecturer described the method of examining malarial blood for the parasite, and explained in detail the various forms of parasite seen in the disease and their mode of growth. He reviewed the different ways in which the parasite, having established itself in the human body, might accomplish the destruction of its host. He showed how in many parts of the tropical world among races which had been long infected by the disease there had developed a partial immunity. The parasite there infected the young children at an early age; if not too heavily infected they gradually became immune, and parasites could not be discovered in their blood. In his second lecture Sir Malcolm traced the history of the malarial parasite in its passage from man through the mosquito back to man, giving in detail a review of the work of Sir Ronald Ross and his discovery that the sexual life history of the parasite was passed in the anopheles group of mosquitos, which could transmit the disease. Many slides were shown in illustration, lent by Sir Ronald Ross, some being photographs of the original dissections made by him in Calcutta in 1898. In the third lecture Sir Malcolm Watson referred to the discovery that mosquitos not only carried malaria but also yellow fever, as was demonstrated by a commission of American workers in Cuba in 1900, during the Spanish-American war, when this fever was specially severe. A different type of mosquito, the *Stegomyia fasciata*, was found to transmit this disease. An active campaign against the mosquito during the following year cleared this disease out of a city from which it had not been absent for over two centuries. The lecturer then described the wonderful achievements in preventive medicine of the Americans in the Panama. From 1904 to 1906 sanitary work was carried on which resulted in clearing away malaria and yellow fever from the Panama Canal zone. A film was shown illustrating the great work of the Americans, in which the whole of the life history of the malarial parasite, both in man and in the mosquito, was demonstrated. A representation of the mosquito sucking blood from a patient was shown; this film was lent by the courtesy of Dr. Andrew Balfour of the London School of Tropical Medicine and Hygiene. Various methods of controlling malaria were illustrated, including the rendering of houses mosquito-proof and the therapeutic use of quinine. Cinematographs were also exhibited showing the process of emergence of adult mosquitos from pupa cases.

Anderson College of Medicine, Glasgow.

The formal opening of the winter session at the Anderson College of Medicine took place on Tuesday, October 14th, when an address was given by Dr. Andrew Balfour, C.M.G., director of the School of Tropical Medicine, London. There was a large attendance of students and the general public, who listened with the greatest attention and interest. Dr. Balfour chose as the title of his address "Vistas and visions—some aspects of the Colonial Medical Service." He gave a comprehensive survey of the great field for research in tropical diseases, and indicated the wide range of opportunity for interesting and important work afforded in the Colonial Medical Services. He described the many different diseases which would be met with in a tour of the tropics, pointing out the great need for continued research into the etiology of these, several of which were still obscure. He instanced particularly bubonic plague, which continued to take a heavy toll of human lives in India, the Gold Coast, Ashanti, and Nigeria, despite

their increasing knowledge of the bacillus and its carrier, the rat. The campaign against rats had been pursued with relentless vigour, but without success in coping with the disease. French workers on the African west coast had explained this by the possible presence of healthy human and of healthy cattle carriers of the disease. Dr. Balfour referred also to the outbreak of what might be called a new bacillary disease associated with ulceration of the throat in Egypt. In speaking of leishmaniasis, he pointed out that though Sir William Leishman discovered the malady and its protozoal origin many years ago, they were still ignorant how the parasite effected a lodgement in the human body. He emphasized the fact that the primary need for medical workers in the tropics was a microscope—that, indeed, this instrument there was as valuable as a stethoscope, if not more valuable.

England and Wales.

Central Midwives Board.

The Central Midwives Board for England and Wales met on October 9th for a special meeting and the ordinary monthly meeting. Sir Francis Champneys presided.

As a result of communications from the Ministry of Health the Board amended the first paragraph of the note at the back of the form of sending for medical help (Rule E. 23 (*a*), page 31), to read:

> "The medical practitioner responding to a call *in the case of any emergency, as defined in the Rules framed under Section 3, 1 (e) of the Midwives Act, 1902 (see Rule E. 20)* will be paid his fee by the Local Supervising Authority for his attendance on this case, in accordance with the scale prescribed by the Ministry of Health."

A resolution was adopted requesting each local supervising authority to supply the Board with answers to the following questions:

1. What drugs and antiseptics (including prophylactic drops for eyes) are carried and administered by the various midwives in your area?
2. What number of midwives practising in your area use "preparations containing opium" as permitted under the "Dangerous Drugs Regulations"?
3. Do you give any directions regarding the use of drugs by midwives in your area? If so, state what they are.
4. Have any cases come to your knowledge in which a drug has been wrongly used? If so, state date, occasion, and result.
5. Are any lectures or other forms of instruction arranged for midwives in your area regarding the use of such drugs and solutions as may be required in practice, the conditions which call for their use, the mode of their administration, and their dangers?

Annual Medical Service in Liverpool.

The annual medical service took place in St. Luke's Church, Liverpool, on Sunday, October 19th. There was a good attendance of medical men, a minority only being in academic dress. The Lord Mayor and Lady Mayoress were present in state. The University was represented by Vice-Chancellor Adami and many past-presidents of the Medical Institution were present. The Bishop of Liverpool, Dr. A. A. David, preached the sermon, taking as his text John i, 12. At the outset he drew attention to the impossibility of translating exactly the Greek word into a corresponding word in English. The authorized version used the word "power," the revised version "right." The Greek work might be best paraphrased by "permission, and power to obtain." His discourse dealt with the efficacy of prayer and its helpfulness in all the straits that beset the life of man. In becoming sons of God the endeavour should be to help one another by encouragement and by confidence in achieving the high ideals set before mankind through religion. The offertory, which was on behalf of the Royal Medical Benevolent Fund, amounted to £81 12s. 1d. The local honorary treasurer will be pleased to add to this amount donations of members who were unable to be present, and Dr. J. E. Nevins, 32, Princes Avenue, will gratefully acknowledge their receipt.

The Liverpool Medical Institution.

The first meeting of the eighty-sixth session took place on October 16th. There was a large attendance of members and associates, and the President, Mr. R. C. Dun, F.R.C.S., delivered an inaugural address on "The banner of our pride." After an allusion to the untimely death of his predecessor, Mr. G. P. Newbolt, he said that the number of members was now 486, that the library had quite recovered from the starvation period due to the great war, and drew attention to the Endowment Fund instituted for its maintenance. Mr. Dun's address was an historical survey of the origin, progress, and vicissitudes of the Knights of St. John of Jerusalem. A religious militant order, it was founded in 1048, and its object was to protect the holy places in Palestine. The knights hospitallers played an important part in the Crusade, and for some centuries their chief seat was the island of Malta. Through dissension and persecution the English contingent settled in Clerkenwell, where the knights hospitallers amassed great wealth, which was lost to them in the overthrow of the monastic institutions. It never ceased to tend the wounded and sick in campaigns, but the Order practically became merged at the Geneva Convention in the Red Cross Society, whose beneficence and unexampled munificence was within the memory of all who had suffered during the great war. It was the perusal of such stirring episodes intimately associated with the practice of first aid and medical treatment of the wounded that led Mr. Dun to borrow from Macaulay the title of his address, "The banner of our pride."

Mr. Thelwall Thomas proposed, and Dr. Hill Abram seconded, a vote of thanks for an address which revealed much of painstaking research, and the members warmly acclaimed their appreciation of it. Afterwards the President entertained the members to refreshments, and provided them with an excellent musical display.

London County Council Report.

The third volume of this report for 1923 is devoted to public health.[1] It includes the reports of Sir William Hamer as county health officer and school medical officer, both of which have been briefly referred to in this Journal (July 19th, p. 125). In addition, the volume contains chapters (XXV, XXVI, and XXVII) dealing with general public health administration, main drainage, and housing. Concerning tuberculosis it is pointed out that responsibility for its control in London is divided between the County Council and the metropolitan boroughs, the former providing or arranging for the residential treatment required through a public authority (other than Poor Law guardians), and the latter for dispensary treatment. The total residential treatment in 1923 is represented by 1,173 beds occupied at the end of the year by insured persons and ex-service men, and 992 occupied by children and adults outwith the two above-mentioned classes. Including both groups the admissions during the year were 5,326, in addition to 102 cases referred to the Invalid Children's Aid Association. Permanent tuberculosis care committees, representative of statutory and voluntary organizations, are in operation in nearly all the boroughs. In connexion with the dispensary service the attention of the London Panel Committee and the British Medical Association has been called to the desirability of securing earlier notification. The borough councils have been urged to arrange for tuberculosis officers being appointed visiting consultants for tuberculosis at Poor Law infirmaries in their areas. There are now 31 tuberculosis dispensaries and two branch dispensaries in London. Dental treatment is included in the service.

For venereal disease the County Council and neighbouring authorities have a joint scheme for free diagnosis and treatment of in-patients and out-patients at 29 hospitals, and for in-patients only at 7 hostels. Practitioners secure at the cost of the Council scientific reports on materials from suspected cases, and approved practitioners may obtain free of cost salvarsan or its substitutes. Rescue and preventive work received attention by a central council of public authorities and voluntary agencies. The provisions of Part I of the Children's Act, 1908, are duly administered, but the Council has been of opinion since 1920 that that part of the Act requires amendment. There were 360 cases of puerperal fever and 753 of ophthalmia

[1] P. S. King and Son, Ltd. Royal 8vo, pp. 148. 2s. 6d. net.

neonatorum; two cases occurred in which strong nitric acid had been put into the eyes of newly born infants by midwives in mistake for a weak solution of nitrate of silver, resulting in one case in total blindness of one eye and in the other of very great impairment of sight. The Council has informed the Midwives Board of its opinion that the use of nitric acid by practising midwives should be prohibited. Inquiry with regard to tuberculous milk is reported. At four inspections of cows in London 7,370 cattle were examined, and no case of generalized tuberculosis was detected, but in 125 cases other unhealthy conditions were found. The action taken with regard to various diseases of animals, especially foot-and-mouth disease, is reported.

In the chapter on main drainage, experiments in the biological treatment of sewage are briefly mentioned, and an account is given of administrative action regarding storm and flood relief. The chapter on housing records the year's operations under the Act of 1923 in respect of many schemes.

EMPLOYMENT OF MARRIED MEDICAL WOMEN.

The General Purposes Committee of the London County Council is proposing to revert to the former rule whereby women doctors, like other women employees of the Council, were compelled to resign their appointments on marriage. In 1916, as a temporary expedient during the war, the rule was suspended, and married women continued in employment in various positions. In 1921, when the rule was re-established so far as other women employees were concerned, it was thought desirable to make an exception for a further period of three years in the case of medical women, in view of the difficulty experienced in obtaining practitioners with suitable qualifications. The number of medical women at present employed in the service of the London County Council is 34 (17 of whom are part-time officers), and only three of these are married. It is proposed to retain the services of the married women doctors now employed, as they have had valuable experience of school medical work, but to make the rule apply to medical women marrying in future.

CITY OF WESTMINSTER HEALTH SOCIETY.

Twenty years ago a society was formed for "the improvement of health conditions in the City of Westminster," and the annual report recently issued for the year 1923 shows that the society has cause for satisfaction. It has seen the infant mortality rate decrease from 120 to 47.2 per 1,000 births since its activities began. Last year the rate for London as a whole was 61 per 1,000. The work in maternity and child welfare includes visiting by salaried and voluntary workers, and the making of arrangements for pre-natal examination and skilled attention during confinement. Instruction is given in mothercraft, with particular reference to the correct clothing of infants and school children. Nasal hygiene receives special attention, and breathing exercises are taught at one of the centres where any form of nasal obstruction is sought out, and instruction given with regard to the use and care of handkerchiefs. Students are encouraged to visit the centres maintained by the society, and during 1923 seventeen attended for practical training in various branches of the work. The report contains a detailed analysis of the results of medical inspection of over a thousand children under school age. It is recognized by child welfare workers that there is a dangerous and important gap between the infant welfare centre and the time when the child reaches school and again comes under regular medical supervision. The medical inspection of the pre-school child has, however, received attention in Westminster, and the report by Dr. Olivier Richards is instructive. The child is examined at each visit at intervals of one to three months, and advice is given to the parent concerning health and hygienic management. It is emphasized that the welfare centre is not a treatment centre, and if some disturbance in health or physical defect is found the parent is advised what steps to take. In the younger age groups the most frequent error in management is some wrong method of feeding, and the causes of difficulty in breast-feeding are analysed in detail. While "general conditions of the mother" account for nearly two-thirds of the failures to maintain breast-feeding, the large majority of these cases are not classifiable under the usual diseases contraindicating breast-feeding, but are due to "insufficient rest" during the puerperium and to "misgivings" and lack of confidence on the part of the mother or her relatives: both these factors should respond to education. In the older children (2 to 5 years) the chief error discovered is defective hygiene, and the society is doing good work by teaching parents the importance to the child's health of fresh air and daylight, correct clothing, cleanliness, and regular habits.

Ireland.

MEDICAL ORGANIZATION IN THE FREE STATE.

WELL attended meetings of the medical profession in the Free State have been recently held in Carlow, Cork, Limerick, and Clare. The meetings were addressed by the Irish Medical Secretary, and schemes of organization for each of the county and borough areas were arranged. The units adopted for organization were generally the Poor Law Union and the Health Board areas. At a meeting of the County Clare medical practitioners recently held in Ennis the following resolutions were passed unanimously:

1. That this meeting of the County Clare medical practitioners is of opinion that there is an urgent need for thorough organization of the profession throughout Ireland; that we believe that that is best done by the establishment of county medical associations with a central delegate body in Dublin and an executive such as the Irish Medical Committee.
2. That the first requisite to organization is money, and, therefore, we are prepared to contribute financially to any reasonable extent required, and we are also prepared to pledge our fullest co-operation with the Central Committee, even to the extent of resigning our public offices in a body in the event of the conditions of medical service offered being considered unsatisfactory.

MILK SUPPLY OF DUBLIN.

The establishment of municipal milk depots in Dublin, with the object of fixing a reasonable price for milk in the city, has been suggested, following the protest aroused by the action of the milk dealers in raising the price to 8d. per quart. Dr. O'Dwyer, a member of the borough commission appointed by the Free State Government to take the place of the dissolved corporation, has stated that if the baby clubs in the city and the Infant Aid Society desired to extend their activities and organization, and approached the commissioners with a view to being afforded special facilities, the matter would receive immediate consideration. The Infant Aid Society and the baby clubs, which are doing very good work in supplying milk at a low price in the various depots under their control, are in receipt of a grant of £3,200 from the commissioners and also £3,200 from the Government to assist them in their efforts. It would appear that the commissioners are reluctant to take the responsibility of running milk depots, but are prepared to assist financially the further extension of the enterprises of the baby clubs and Infant Aid Societies with regard to supplying milk to the poor.

A BELFAST PRESENTATION.

The members of the visiting staff of the Royal Victoria Hospital, Belfast, presented Dr. W. Calwell and Dr. H. L. McKisack, their retiring colleagues, with a handsome piece of silver each, and entertained them as their guests at the annual dinner of the medical staff. Dr. Calwell joined the staff as assistant physician in 1895, and Dr. McKisack as assistant physician in 1899.

CORK WATER SUPPLY.

At a recent meeting of the Cork Public Health Committee the city analyst, in dealing with a sample of water taken from the River Fergus at Coachford, stated that the water "is similar to common untreated sewage. The contaminations which produce the polluted water should be subjected to some form of treatment by sedimentation, or allowed to flow on carriers on a field before being allowed to flow into any stream of small volume." The analyst stated that the Macroom Rural District Council was responsible for applying the remedy described. The Committee decided to take proceedings against the Macroom Rural District Council.

Ballymoney Board of Guardians.

Arising out of a dispute with regard to the inadequacy of the remuneration allowed by the Ballymoney Board of Guardians for the administration of anaesthetics in the union hospital, Dr. Wallace, medical officer of the Castle-quarter dispensary district, wrote to the guardians stating on behalf of the doctors who attended the recent conference that none of them would be available to anaesthetize or assist at operations after October 2nd, 1924. The clerk said he had sent a copy of the letter to the Ministry, and had received the following reply:

"I am directed by the Ministry of Home Affairs to acknowledge receipt of your letter of the 27th inst., respecting the refusal of certain medical practitioners in the Ballymoney Union to assist at operations in the Route district hospital, and to state in reply that if the medical officer of the hospital requires assistance, and the case is urgent, you should endeavour to obtain the assistance of the nearest available medical practitioner who is willing to act, at the best terms possible. If the case is not urgent it is the duty of the medical officer of the hospital to apply to the committee of governors for authority to obtain the necessary assistance."

India.

School Medical Inspection in Simla.

The quarterly report for the period ending December 31st, 1923, of Captain J. R. D. Webb, I.M.S., the medical officer of Simla, embodies an account of the new system of school medical inspection introduced by him in the previous September. Thus, out of 1,636 boys examined, no fewer than 1,111 (67 per cent.) required some form of treatment; skin diseases were accountable in 233 cases, tonsils in 214, and glands in 287. Defective vision was found in 67 boys and defective hearing in 53. The application of the system had already resulted in an appreciable fall during each succeeding month of the number of boys suffering from various diseases. Captain Webb proposes to make an addition to the system by the provision of expert medical assistance in the diagnosis of diseases of the eye, ear, nose, and throat, and by the organization of instruction classes in hygiene for both masters and children. The results of medical examinations are recorded on index cards and accompany any boys who are transferred from one school to another. He advocates the extension of this scheme to include schools for girls.

Lady Reading Hospital, Simla.

The announcement of the formal opening of the Lady Reading Hospital in Simla, on April 25th, appeared in our columns of May 17th (p. 881); and the first patients were admitted without delay. In the first four months of its existence 427 patients have been treated, 69 maternity cases dealt with, and 66 major operations performed. The marked popularity of the institution indicates the extent of the need that is being met. The hospital starts free from debt and with a sufficient endowment for its present needs. The Simla municipality is co-operating cordially in the scheme and is represented on the hospital's governing body.

National Baby Week, 1924.

The report of the central executive committee of National Baby Week in India in 1924 contains a record of the successful venture launched by the Countess of Reading in August of the previous year. The original committee appointed by Her Excellency included representatives of the Lady Chelmsford League for Maternity and Child Welfare and the Indian Red Cross Society, and these two societies jointly guaranteed sufficient funds for the project. No general appeal for public subscriptions was required, though the scale on which the scheme was ultimately organized proved to be much greater than was anticipated. Local governments, corporations, social welfare organizations, and private individuals contributed generously, and the committee was able to close its accounts without calling upon the two guaranteeing societies to any great extent. The success of baby weeks in the various centres has made it clear that their annual repetition is desirable, each locality selecting the date most convenient to itself. Several valuable conferences of health workers were held during the 1924 Baby Week, and will probably be increased in number during the coming year. The report includes a short summary of the reports from many of the towns concerned, programmes of events and competitions, and suggestions put forward for the future. The numbers of visitors in several towns were embarrassingly large, but the educational value of the whole undertaking was convincingly demonstrated.

Correspondence.

THE BRACKENBURY TESTIMONIAL.

Sir,—May I ask the hospitality of your columns to convey my most hearty thanks to those members of the profession who subscribed to the gift presented to me on Wednesday last? I have, of course, been able personally to thank only a few, but I hope that through them my thanks may have been conveyed to many others. I should wish, however, that all, without exception, might know how very much I value their kindness, appreciation, and encouragement.—I am, etc.,

Stroud Green, N., Oct. 20th. H. B. Brackenbury.

⁂ We publish in the Supplement this week a full report of the speeches made at the presentation on October 15th.

DANGER OF STRONG APPLICATIONS IN THE PROPHYLAXIS AND TREATMENT OF OPHTHALMIA NEONATORUM.

Sir,—May I, through your columns, draw the attention of practitioners to the danger of continued use of strong applications in cases of ophthalmia neonatorum? Every year since St. Margaret's Hospital for ophthalmia neonatorum in London has been opened by the Metropolitan Asylums Board there have been admitted two or three cases in which both corneae have been destroyed or very severely damaged by the use of mercury perchloride in strengths of 1 in 500 to 1 in 3,000 used four or five times a day, or by silver nitrate (10 or 20 grains to the ounce) used as drops two or three times a day. Although these drugs properly applied in correct dilutions are satisfactory, there is great danger if they are not properly used. I therefore generally teach classes of midwives, etc., who attend this hospital to use protargol 10 per cent. or acriflavine 1 in 1,500 in castor oil, as both safe and effective in the prophylaxis and treatment of the disease.—I am, etc.,

London, W., Oct. 16th. M. S. Mayou.

THE MADRAS GOVERNMENT AND INDIGENOUS SYSTEMS OF MEDICINE.

Sir,—Three years ago the Government of Madras, at the instance of the Madras Legislative Council, appointed a committee to inquire into and to report upon the question of the recognition and encouragement of indigenous systems of medicine in vogue in the Madras Presidency. The whole question was discussed fully, fairly, and crushingly in the issue of this Journal dated September 15th, 1923, from which I venture to quote the last two paragraphs:

"The opinion is expressed in the report that no Western scientist should think of criticizing Ayurveda until he has learnt the Sanskrit language and studied the subject for some years under a competent Acharya. But the Western scientist has no need of any such prolonged and detailed study: he will, without the least difficulty, recognize the familiar features of the phase of development reached by Ayurveda, when he recalls the history of his own science. Similar unsupported metaphysical and theoretical dogmas were to be found in both. The 'authority of the Scriptures' was regarded as equivalent to the truth in the one as in the other; and our grandfathers accepted without a doubt the account of the creation of the universe given by Moses, and regarded the first chapter of Genesis as the word of God. In the last hundred years science has emerged from the metaphysical stage into the clear light of positive knowledge, and *if the Madras Government has the interests of the Indian people genuinely at heart, it will expend its energies in planting modern science in the country, by the agency of scientists and teachers trained in Western methods, instead of endeavouring to stimulate the belated indigenous systems into renewed activity.*

"There are many indications in the report that Ayurvedists feel the need of European methods—the microscope, bacterial technique,

etc. What they really need is an altered scientific outlook; they need to understand the difference between metaphysical and positive knowledge, between the study of facts through the coloured glass of theological dogma and their study in the plain daylight of science. *The Madras Government is apparently at the parting of the ways.* It will be interesting to see whether it decides to set things moving in the path of progress by the encouragement of European scientists, or pushes the country back into the old metaphysical rut." [The italics are my own.]

Most unfortunately the Government of Madras has not seen fit to adopt the excellent advice tendered to it in the above paragraphs, and has now, to the consternation of its medical officers, decided to constitute a Board whose functions will be as follows:

"(1) To form an association of practitioners of the indigenous systems *on the analogy of the British Medical Association.* [Again the italics are my own.]

"(2) To formulate detailed proposals for a school or college of Indian medicine to be started in Madras.

"(3) To report whether, instead of the starting of a Government school or college, scholarships may be given in certain existing institutions."

It is of the first importance that young medical men in this country should clearly realize the implications of this astounding order before they venture to enlist themselves in the service of a Government in which such things are possible. The chief systems of indigenous medicine in the Madras Presidency (the Ayurvedic and the Unani systems) have been so well described in the article of September 15th, 1923, already alluded to, that it would be a work of supererogation to deal with them at any length here. Their physiology is that of the so-called "humours": their pathology resembles that which was current in the time of Hippocrates—a pathology which all other civilized peoples have for centuries cast behind them. Their views on drugs are primitive; they know nothing of their standardization, and rely rather on the phase of the moon under which the plants are gathered, or the dung of the sacred cow, on virgin's urine, and on similar harmful trash. Western medicine has nothing to learn from them that it has not long ago learnt, classified, and standardized. I can find no attempt in the report of the committee appointed by the Government of Madras to prove the hypotheses on which the whole of this archaic and effete system of medicine is supposed to be based. A glaring light is cast on the committee's mentality by the astounding claim it makes that the ancient sages so trained their senses that their theories regarding the structure of the atom were not mere theory, but were the result of direct observation and visualization by their highly trained senses. Could credulity plumb a more abysmal depth than that which this claim reveals?

Unfortunately this question of the State recognition by the Madras Government of this burlesque pretender to the claim of being a system of medicine does not stand alone. For many years past the relations of the Madras Government with its medical officers has on a number of occasions been far from a happy one, and quite recently there has been a great feeling of discontent and annoyance amongst the medical officers now serving, with regard to the management of the big Presidency hospitals. The Government, which proposes to launch out into expenditure on an effete and hopeless system of medicine, has been issuing stringent orders as to the cutting down of the diets and of other items of expenditure in the very important Presidency hospitals. My information is to the effect that those orders have not met with the approval of the officers of the institutions concerned, and that the opinion is widespread among them that if they are carried out the efficiency of the hospitals will be seriously diminished. The matter attained such proportions that a number of articles appeared in the newspapers, criticizing the policy of retrenchment which had been followed, and in order to defend itself the Government issued to the press in July of this year a defence of its policy, in which it was stated that orders had been passed on several of the recommendations for effecting retrenchments "in consultation with the superintendents of the hospitals." I do not doubt that the superintendents were consulted, but was any respect or attention shown for their opinions? I have reason to doubt whether there was.

There is a further statement in the Government's defence which has caused very deep and widespread indignation in the ranks of the Service. It is said "that people were encouraged to resort to the Presidency hospitals of Madras, not so much with a view to medical treatment, but in order to enjoy the amenities which hospital life offered." As a superintendent of one of these institutions in the past, I have read this statement with incredulity and indignation, and find it difficult to find suitable terms in which to characterize it. The work and the repute of those hospitals have gone out into all the world; their diets were drawn up by men who knew what the sick need, and who recognize, as laymen sometimes seem incapable of doing, how very much the success of medical and surgical treatment depends on erring on the side of generosity in the diets given to really sick patients. Be it remembered that these hospitals are in the heart and centre of a population of over forty million people, and that into them are poured a large proportion of the difficult and desperate cases from all the districts of the Presidency. An added sting has been given to the order by the fact that the recommendations for the cutting down of the diets have been made on the advice of an inspecting officer, who, whatever his admirable qualities may possibly be, has, I believe, no qualification that would entitle him to registration in Great Britain, whilst the officers in charge of the Presidency hospitals are admittedly the pick of the local branch of the Indian Medical Service. It is not even as if there were no fully qualified medical Indians in Madras, for there are very many. That there may be room for economies in minor matters no one will be prepared to dispute, but the suggestion that patients are encouraged to resort to the hospital to enjoy a loaf in luxury was certainly in my time—and I cannot doubt still is to-day—unfounded in fact, damaging to the reputation of the officers concerned, and regrettable in the highest degree. *If this is the way that the Madras Government is going to write in the press of its medical officers,* who are, by virtue of their position, debarred from replying in their own defence, it will have little cause to wonder if the young British-born doctor turns his back on service in the Southern Presidency; and this apart altogether from the merits or demerits of the proposed retrenchments.

The much larger question is that with which I have opened this letter—namely, that of the recognition and encouragement in India of a so-called system of medicine for which a man trained in Western methods can have nothing but pitying contempt. If, knowing of this new and retrograde movement, he enlists in the service of the Government, he will find it difficult indeed to avoid being made an instrument for the carrying out, to some extent at least, of a system of medicine which cannot fail to redound to his discredit and to damage his reputation. This is no idle fear, for several of the senior officers, now or recently serving, have been called on by Government to help them in this task, and my information is that they have indignantly declined. Will the man who goes in with his eyes open have the same liberty of action as these senior men who entered at a time when such a departure on the part of Government was undreamt of, and if suggested as a possibility of the future would have been laughed at as grotesque and ridiculous?

It is very difficult indeed to believe that the members of the Madras Government can really believe in this fantastic system of so-called medicine. Are we to conclude, then, that they have yielded to Indian clamour and that they are acting in defiance of everything which, as educated men, they know and believe, or is the explanation to be sought in the assumption that, now that medicine is a transferred subject under an Indian Minister, the latter has the last word in such decisions, and his European colleagues are practically powerless?

Whichever is the explanation, I would ask once again, "Is it wise for the young British medical man, trained in modern methods, to enter the service of a Government in which such fantastic experiments are possible?" The emphatic answer of the British Medical Association should, in my opinion, be in the negative, and should remain so until there is clear evidence that such retrograde and deplorable experiments are in some way made impossible.

One last word: We have trained a large number of medical men in our Indian colleges. Many of these have taken degrees which deservedly stand high, and which entitle their holders to a place on the British *Medical Register*. Are these men going to stand idly by and raise no protest against what both their intelligence and their heart must condemn? I sincerely trust they will not. Those of us who have helped in the past to make them what they now are will look to them to justify our expectation that they will prove not unworthy of what Western science has taught them.—I am, etc.,

R. H. Elliot,
Lieut.-Colonel I.M.S.(ret.).

London, W., Oct. 15th.

THE REAL DEATH RATE.

Sir,—The erroneous notion still exists, as has recently been revealed in articles in several leading newspapers, that the death rate by itself is always a fairly reliable measure of the health of a people. I have thought for some time that we might be able to give the public a simple means of avoiding this and other fallacies on the subject. The erroneous notion that if the inhabitants of two countries have a different death rate they must therefore have a different average of health is doubtless connected with the other common fallacy that 1,000 divided by the death rate (per thousand) invariably gives the average duration of life. To estimate the average duration of life one must, of course, consider not only the death rate, but also the survival rate, if any—the survival rate being the rate of the natural increase of the population, that is, the birth rate *minus* the death rate; one must divide 1,000 by the death rate *plus* a fraction of the survival rate. I have found that nine-twentieths is the fraction which gives an estimate most closely approximating to the result obtained by logarithms. But ten-twentieths gives an estimate which is perhaps sufficiently close, and a half is an easily remembered and easily worked fraction. I wish to suggest, therefore, that the death rate *plus* a half of the survival rate (D + ½ S) might be universally regarded as the real or comparable death rate of a country. Dividing 1,000 by the death rate only gives a close estimate of the average duration of life when the birth rate and death rate are actually or nearly equal; but dividing 1,000 by D + ½ S always does approximately give the average duration of life, so from this one would seem to be justified in regarding D + ½ S as the real death rate of a country.

If my suggestion were approved and adopted, people could easily and quickly make a sufficiently accurate comparison of the average health in different countries, and thus avoid, for example, the frequent error of suggesting that France has a much higher mortality than England. People could also be taught that 1,000 divided by D + ½ S gives an approximate estimate of the average duration of life, and therefore that D + ½ S cannot be under 15 unless it is possible for the inhabitants of a country to have an average duration of life of over 66 years; and newspapers would cease to publish articles suggesting that countries may come to have a birth rate and death rate of 6 per thousand, as this would at once be seen to imply the possibility of an average duration of life of about 166 years.—I am, etc.,

B. Dunlop.

London, S.W., Sept. 27th.

THE BLOOD IN MILD CASES OF MALARIA.

Sir,—In a recent work on haematology this sentence occurs in the description of a coloured plate illustrating tertian malaria: "In view of the recent and moderately severe infection, the red cells show no anaemic changes." My experience of four relapsing cases is that no paroxysm is so slight as not to excite anaemic changes. And, by the courtesy of asylum medical officers who supplied slides from several other cases, I am able to add that no case is too recent to escape such changes. I saw no quartan or subtertian infection, but should expect the same changes in these.

It is necessary to recall a few facts of haematology. Polychromasia is a sign of unusually active erythrogenesis, and is conspicuous in the blood of the newborn babe, where it is associated with nucleated reds. In adults polychrome erythrocytes are still readily attracted into the blood stream and appear in minor anaemias of convalescents, whereas erythroblasts only appear in more serious anaemias or after severe haemorrhage. In the so-called pernicious anaemias a toxin is also exciting the marrow to pathological regeneration. The first indication of this is the appearance of punctated erythrocytes, which later on are associated with megaloblasts, giving a blood picture of anisocytosis, polychromasia, and normoblasts (normal regeneration), combined with punctate basophilia, Cabot rings, and megaloblasts (pathological regeneration).

In malaria, as long as parasites are present in the blood I find erythrocytes showing polychromasia, anisocytosis, and often hypochromasia, and after each paroxysm punctate basophilia, Cabot rings, Jolly bodies, and sometimes erythroblasts. In short, there is anaemia with unusually active normal regeneration, accompanied at the paroxysm with brisk pathological regeneration.

At the same time leucocytes show neuteropenia, monocytosis, and sometimes eosinophilia and plasmacytosis. Amitosing lymphoid cells, myelocytes, and leucoblasts may usually be found after smart attacks. Now myelocytes often accompany a sharp leucocytosis from any cause and may be compared to normoblasts. But leucoblasts are quite pathological, and their entry into the blood is due not to chemiotaxis but to direct toxic action on the marrow, so that they are comparable to megaloblasts. Taken together, all four are characteristic of toxic anaemia such as the pernicious anaemias. That toxins of varied origin may act on the marrow in much the same way is proved by the fact that small doses of lead soon produce a similar blood picture even to the leucoblast. Obviously these toxins act mainly on the red, but also disturb the white elements of the marrow.

These facts suggest that in suspected cases the presence of pathological regeneration may assist diagnosis in malaria just as in pernicious anaemia and in lead poisoning. I do not know how long it persists, but it was still visible four and a half days after a paroxysm in which under treatment parasites had disappeared in forty hours, and of the erythrocytes 1 per cent. showed polychromasia and 1 in 1,000 Cabot ring or punctate basophilia. Punctate basophilia is entirely pathological and demands investigation just as much as albuminuria or glycosuria. In any case it is useful to recognize these changes.

With regard to technique, the following note may be useful:

For leucocytes Leishman stain is satisfactory, but more often than not it misses basophilia, Cabot rings, and Schuffner's dots in erythrocytes. Manson's methylene blue answers well when made polychrome by boiling gently over a small flame for one minute about 8 c.cm. in a clean test tube. On cooling add 2 c.cm. of the original solution, and it is ready for use and will keep for months. It is convenient to have two small wide-mouthed bottles with glass stoppers. One contains 20 c.cm. of pure methyl alcohol, and films are dropped in to be fixed by laying the bottle on its side for three minutes or more. It may be used daily for months. The other contains an ounce of distilled water, and five drops of 1 per cent. aqueous solution of eosin and two drops of polychrome Manson's blue are added and mixed for each examination. Fixed films are transferred with forceps to stain for half to two hours or longer—washing cautiously if overstained. Films stained by Leishman in the usual way may, after examination of part of the film, be further stained in above solution with fair results. Distilled water, drop tube, and clean bottles are necessary and thin films desirable.

—I am, etc.,

Robert Craik, M.D.

West Ealing, W.13, Oct. 17th.

GALL STONES AND CANCER.

Sir,—I was surprised and pleased to see the letter from Dr. Fiddian (September 27th, p. 597). His views are much akin to mine. I differ somewhat from him as to the nature of the cell affected; the epithelial cell is always the one affected, and it never forms a tissue—it lives its own life. A letter of mine was published in the Journal last year in which I said cancer was a reversion to embryonic conditions. This does not explain exactly what I mean. I should have said the epithelial cell was arrested in its growth nearer to

the embryonic form than the fully developed cell. Reversion to type is a term which is too loosely used; the type is never lost, Nature is very "careful of the type." What I believe is meant by reversion is a casting off of adventitious accretions when the external stimulus which called them into existence has ceased to act. I agree with Dr. Fiddian when he says it is clearly a struggle for existence on the part of the epithelial cells when faced with a new and menacing addition to their environment, and it is the product of the cells which die in the fight which causes all the trouble in cancer, as shown in the later stages of Dr. Leitch's experiments. The epithelial cell knows no boundaries. When the nature of cancer is officially recognized I believe my views will not be very far out.—I am, etc.,

Bolton, Sept. 30th. A. W. Crawford.

BLOOD TRANSFUSION.

Sir,—At the Annual Meeting of the British Medical Association at Bradford Mr. Geoffrey Keynes read a paper on blood donors. In the discussion he states (British Medical Journal, October 4th, p. 615) that the citrate method is the most suitable for general use and that no further advance of importance has yet been recorded.

When in Paris in March, 1924, I saw at the Hôpital St. Michel a method of blood transfusion which I think is an advance in technique of some practical value. The apparatus consists of a glass syringe of 200 c.cm. capacity with an eccentric nozzle. The piston contains in the distal part a small hollow fenestrated box; a screw inside the rod of the piston regulates the volume of the box, which is filled with a mixture of sterile vaseline and paraffin. By moving the piston up and down an even coating of the mixture is deposited on the inside of the glass barrel. The syringe, piston, vaseline, and needles can be kept ready sterilized in a hermetically sealed drum. With this instrument blood transfusion is very much simplified, whole and not citrated blood is given, clotting is delayed for a sufficient period, and the whole operation is reduced to two punctures.

The instrument was designed by Dr. A. Becard and is made by Vincent in Paris. Details of the technique and apparatus can be found in the recently published book *Transfusion du Sang*, by Victor Pauchet and A. Becard.—I am, etc.,

London, W.1, Oct. 8th. Stanford Cade, F.R.C.S.

MEDICAL OFFICERS AND CONSULTING FEES.

Sir,—Dr. Pearce thinks that I am chasing a shadow. He is right. The shadow I pursue is merely that intangible and elusive thing—professional status. It is because, rightly or wrongly, I believe that the Bradford resolution was rather an oblique attack on that status, than a direct one on the few guineas we may receive as consultants, that I, for one, regard it, like Dr. Walker, as "provocative and unnecessary," and ask for its cancellation.

As "Whole Time" wrote in your issue of September 20th, we "stand or fall on our specialized knowledge." If we have none, we are frauds. If we possess any, it should be available for all, rich and poor. There are still some people who will not accept gratuitous services. If there are public authorities so short-sighted as to use the acceptance of these occasional consulting fees as an argument for the reduction of salaries—a phenomenon which I will credit when I meet with it—we can, if it is considered essential, hand over such fees to, say, the after-care committees.

Dr. Pearce and I qualified within a year of each other, and we are both old enough to remember that the biggest fights have always been on account of "shadows." Witness the prolonged struggle which was necessary to procure full military rank for the medical officers in the army and Indian services. Ask an old army medical officer what that "shadow" meant to him! Nobody—I least of all—will quarrel with Dr. Pearce for his attitude. Such things are matters of personal evaluation. What to one man is merely the pursuit of a shadow may mean to another the salvation of his soul.—I am, etc.,

October 18th. Tuberculosis Officer.

PETER LOWE'S "CHIRURGERIE."

Sir,—The note in your issue of October 18th about the first edition of this book is not correct. Three copies are known to the writer—one in the Radcliffe Library, Oxford; another in the library of the Royal Medical and Chirurgical Society of London; and a third in the library of the Royal College of Physicians of Edinburgh.—I am, etc.,

October 20th. Walter Hurst, Librarian, Royal Faculty of Physicians and Surgeons, Glasgow.

Obituary.

JOHN HAMMOND MORGAN, C.V.O., M.A., F.R.C.S.,

Consulting Surgeon to Charing Cross Hospital.

We regret to record the death on October 11th, at his house in Connaught Square, of Mr. John H. Morgan, consulting surgeon to Charing Cross Hospital and to the Hospital for Sick Children, Great Ormond Street.

John Hammond Morgan was born on August 19th, 1847. His father, John Morgan, F.R.C.S., was for many years one of the leading general practitioners in the West End of London. From Harrow he went to Trinity College, Oxford, and graduated M.A. in 1873. Like his father before him, he studied medicine at St. George's Hospital, and obtained the M.R.C.S. diploma in 1872 and the Fellowship in 1876. He was for some years surgical registrar at St. George's and assistant surgeon to the West London Hospital. Later he was appointed assistant surgeon to Charing Cross Hospital and to the Hospital for Sick Children, and surgeon to the Alexandra Hospital for Hip Disease. For some years he served as examiner in surgery at the University of Oxford, and from 1902 to 1910 was a member of the Council of the Royal College of Surgeons. In 1897 he was president of the Medical Society of London, and delivered the Lettsomian Lectures on "Surgical affections of the urinary tract in children." He drew up the catalogue of the museum at Charing Cross Hospital, and wrote many papers on surgical subjects. On three occasions he held office in the scientific sections at the Annual Meetings of the British Medical Association. In 1878, at Bath, he was secretary of the Section of Surgery; at the London meeting in 1895 he was president of the Section of Diseases of Children; and in 1908, at Sheffield, he was vice-president of the Section of Surgery.

For the following account of Mr. Morgan's career and personal character we are indebted to his friend and colleague, Sir Herbert F. Waterhouse, consulting surgeon to Charing Cross Hospital.

To all who were students at Charing Cross Hospital from 1880 to 1905 the death of Mr. John H. Morgan will come as a distinct personal loss, because no one was ever so completely the students' friend, and no one could have taken a greater interest in their sports, societies, and welfare than he who was always affectionately known to them as "Johnny Morgan." Morgan was essentially a man whom students admire, as he was a brilliant athlete at Oxford, where he was president of the Oxford University Athletic Club, and won the inter-university three-mile race three years in succession. His prowess as a long-distance runner was the more remarkable as he was a man of short stature.

Hospital appointments came to him in full measure; thus he was surgeon to the Hospital for Sick Children, Great Ormond Street, to the Alexandra Hospital for Hip Disease, and assistant surgeon to the West London Hospital. To the writer Morgan's work at Charing Cross, to which he gave such devoted service for a quarter of a century, was well known, as for more than ten years he acted as his assistant surgeon. No man was more scrupulous in his attention to his hospital duties or gave more loyal service to any charitable institution.

Morgan was by no means a showy operator. His surgery was that of the old school, and he had but little sympathy with what he termed "new-fangled ideas." Among his maxims, which he was constantly impressing upon his students, were: "Do just what is required and no more";

"Avoid meddlesome surgery"; and, as regards the abdomen, "Get in quick and out quicker." He was, however, probably a better surgeon than he was generally held to be, because his results were distinctly good, and they, surely, are the true test of a surgeon's merit. Morgan's greatest friend was the late Sir Frederick Treves, for whom he had unbounded admiration, and whose writings might almost be said to have been his surgical bible. Private practice had no attractions for Morgan, and few men of his experience and standing ever made, I imagine, a smaller income. Possessed of ample means, he rather shunned than encouraged private operation cases, and to my knowledge frequently passed them on to Sir F. Treves. On my venturing a mild protest on one occasion he replied: "I don't want the money, and Treves will do it better than I could." This was characteristic of the man and his modesty. Another instance I may mention of Morgan's self-effacement was when the lectureship at Charing Cross Medical School fell vacant. Morgan had, by seniority, the first claim to the post. He requested me to convey to Stanley Boyd his opinion that it would be in the interests of the school that Boyd should be appointed lecturer in surgery, and that therefore he had determined to stand aside in Boyd's favour. He was an excellent committeeman, and acted for many years as chairman of the committee of the medical school.

Morgan was a deeply religious man, a firm adherent of the Church of England, and a staunch Conservative. He retired from the staff of Charing Cross Hospital two years before he had reached the age limit, partly on account of ill health, but chiefly, as he told me, to give a position on the senior staff to his then assistant surgeon, Sir F. Wallis. In spite of ill health and his age (70 years), in 1917 he undertook the duties of surgeon in charge of the Hôpital Anglais at Nevers, and carried on until increasing ill health compelled his retirement. Of all that he did for the students at Charing Cross it is impossible to write in detail. For many years he was president of the Students' Club and a generous supporter of the athletic, football, and cricket clubs, and the man to whom every student turned in time of trouble. He will long live in our memories at Charing Cross as one of the best friends, the wisest counsellors, and the most generous supporters the school has ever had.

Sir Henry Gauvain sends the following appreciation:

The death of Mr. John Morgan will be felt by many with a sense of real personal loss. He typified the old-fashioned surgeon—dignified, courtly, with a high sense of duty, a direct manner which concealed the kindest of hearts and the most generous of instincts. It has been my great privilege to be intimately associated with him during the past sixteen years. On the suggestion of the then Presidents of the Royal Colleges of Physicians and Surgeons he was nominated an original member of the honorary medical board of the Lord Mayor Treloar Cripples' Hospital, and by the unanimous vote of his colleagues was elected chairman of the executive committee of that board. No one could have been more zealous in the conduct of the duties his position entailed. As the more urgent calls on his time diminished he retained ever more keenly his interest in the work at Alton. His visits were always welcomed by all members of the staff, whom he treated with an altogether charming courtesy and consideration, and by the patients, who regarded him with both respect and affection. He was deeply interested in the advances made in the technique of the treatment of our patients, and, tenacious to the sound principles on which conservative treatment of surgical tuberculosis are based, rejoiced in all advances made on these lines. An ardent sportsman and a distinguished athlete, his activities were limited of recent years by reason of a severe accident in the hunting field. Nevertheless, till comparatively lately he managed to travel a great deal, one of his latest considerable journeys being taken with his friend, the late Sir Frederick Treves, to the West Indies. Since his retirement gardening had been one of his great hobbies, and it was ever a pleasure to him to take his friends around the delightful grounds of his beautiful home at Bucklebury Common. In these grounds he had laid out a miniature rifle range for the use of the villagers, and it was a delight to him to see how greatly this thoughtful act was appreciated. A staunch Tory and an ardent patriot, it was a source of great pride and pleasure to him to play his part in the great war as medical chief of the Croix Rouge Hospital for wounded soldiers at Nevers while in his 70th year. I shall always remember him with respect and affection as a staunch and loyal friend, kind and generous to a fault, likeable and lovable, the true picture of "a fine old English gentleman."

SIR ROBERT HENDERSON, K.C.M.G., C.B.,

Major-General A.M.S.(ret.).

Major-General Sir Robert Samuel Findlay Henderson, K.C.M.G., C.B., Army Medical Service (ret.), died in Queen Alexandra's Military Hospital, Millbank, on October 5th, aged 65.

He was born in Calcutta on December 11th, 1858, the son of the Rev. Robert Henderson, senior chaplain in Bengal, and was educated at Bedford School, Fettes College, Edinburgh University, where he graduated as M.B. and C.M. in 1882, and St. Mary's Hospital, where he spent the final year of medical study. Entering the army as surgeon on August 2nd, 1884, he became lieutenant-colonel after twenty years' service, brevet-colonel on November 22nd, 1910, and colonel on January 2nd, 1914, retiring on December 26th, 1917, with the rank of major-general. He had a long list of war services: Sudan campaign, 1885, Suakin, medal with clasp, and Khedive's bronze star; Burma, 1885-89, medal with two clasps; North-East Frontier of India, Chin Lushai expedition, 1890, clasp; Burma, 1891, Wuntho expedition, mentioned in dispatches, *London Gazette*, February 9th, 1892, clasp; North-West Frontier of India, 1897-98, Malakand, medal with clasps; South African war, 1901-2, operations in the Transvaal, Orange River Colony, and Cape Colony, Queen's medal with five clasps. In 1907 he was appointed secretary of the Royal Victoria Hospital, Netley, and from 1908 to 1912 he was secretary to the P.M.O. in India, Sir Francis Trevor. On promotion, in 1914, he was posted as A.D.M.S. at Quetta, in 1915 he was transferred to the 17th Division, and on August 1st, 1915, he was appointed director-general of the New Zealand Medical Force, with the rank of surgeon-general, holding that post till his retirement. He was appointed honorary physician to the King in 1910, in 1917 he received the C.B., and in 1919 the K.C.M.G. Until the outbreak of the war in 1914 he also held the Prussian Order of the Red Eagle.

In his younger days Sir Robert Henderson was a famous international Rugby forward. He was in the fifteen at Fettes; he played in the Edinburgh University fifteen for four years (1877-81), for the last three as captain, and subsequently for Blackheath, when he gained his international cap for England in 1882, 1883, and 1885.

ARTHUR HILL TREVOR,

Commissioner of the Board of Control.

Mr. Arthur H. Trevor took so wide and active an interest in the work of the Board of Control, and was so unremitting in his efforts to ameliorate the conditions and to advance the treatment of persons suffering from mental illness, that his sudden and unexpected death occasions a public loss, and by it the Commissioners are deprived of a colleague of great personality, who was highly esteemed as a friend by each one of them.

Born in 1858, he was educated at Winchester and at Corpus Christi College, Oxford. He was called to the Bar in 1884, and for some years practised on the South-Eastern Circuit and at the Sussex Sessions. Appointed secretary to the Commissioners in Lunacy in November, 1905, he rapidly acquired so close and deep an interest in his new work that it was no small satisfaction to him when, two years later, he was chosen to fill the vacancy on the Commission created by the death of the late Mr. G. H. Urmson, who was the victim of a murderous assault by a patient during an official visit to a mental hospital which, though it was not the immediate cause of his death, had left him in impaired health. Trevor did a prodigious amount of work, not only when on circuit with a medical colleague inspecting

institutions and paying other statutory visits to patients, but also in the preparation of reports, memoirs, and other literary work on behalf of the Board; in all this he was most painstaking, was never satisfied until he had looked up all available references, and what he wrote was always lucid and scholarly. He also accomplished a great deal of useful work as a voluntary member of various committees, extraneous to his official duties, but in aid of the better understanding of mental disorders and the advancement of their treatment: mention, for instance, may be made of the active share he took in the work of the Committee of the Medico-Psychological Association in connexion with Lord Justice Atkin's Committee upon Criminal Responsibility, before which, later on, Mr. Trevor, in conjunction with one of his medical colleagues, gave evidence. He also gave evidence before the Royal Commission on the Care of the Feeble-minded in 1908; and, upon the passing of the Mental Deficiency Act and the constitution in 1913 of the Board of Control, he threw himself heartily into the thus widened sphere of action of the Commissioners.

He was emphatically a powerful link between the professions of law and medicine. An ardent admirer of the latter, he was acutely interested in the broader aspects of medical problems, especially such as those which came up for discussion at the Board, or at meetings of the Medico-Psychological Association and of the Medico-Legal Society, at which he frequently attended. These he delighted to have explained to him by his medical colleagues and by the members of the medical staffs at mental hospitals, with so many of whom his duties brought him much in contact; and, endowed with breadth of vision and a ready grasp of essentials, he was a tower of strength in promoting progress. The link between the two professions—inherent, indeed, in the constitution of the Commission ever since its inception in 1845—which he was ever desirous to see strengthened, was perhaps specially exemplified in him by, first, his constant reference to the exact words of the statute, and then his habitual endeavour, short of their actual infringement, to mould administrative action so as to conform, as far as practicable, to medical aspirations. In this connexion his bent of mind, humane and progressive, was conspicuous in his persistent efforts to secure legislation to facilitate the prompt treatment of mental disorder in its incipient and early stages. Up to within a few days of his death he had been preparing with much zest evidence for the Royal Commission on Lunacy Administration and the Early Treatment of Mental Disorder; and at their first meeting a moving tribute to his memory was paid by the chairman. Mindful of his active interest in their work and his manifest wish to co-operate more actively than the fulfilment of his official duties perhaps demanded, the Medico-Psychological Association in 1910 elected him as an honorary member—a distinction but sparingly conferred, only once previously upon anyone other than a medical man.

C. H. B.

BOLTON GLANVILL CORNEY, I.S.O., M.R.C.S.

Mr. Bolton G. Corney, distinguished in the Colonial Service, died on September 24th at his residence, Nevern Square, West Kensington, at the age of 74, after having suffered for a long period from distressing cardiac complications. He was the son of Mr. Bolton Corney, well known in literary circles in London sixty years ago. Educated at a private school in Barnes, he always desired to lead a seafaring life, especially among semi-civilized islanders; then concluding that his wish might be best attained by going out to the South Sea Islands as a doctor, he studied at St. Thomas's Hospital and received the diploma of M.R.C.S. in 1874. He became well acquainted with many of the groups of islands in the Pacific, and finally settled in the Fijis, being among the doctors whose labours on behalf of the natives, under the headship of Sir Philip Gordon, were eulogized in the article on those islands in the *Times* of October 10th. He wrote some instructive papers in association with his line of work, on the mysterious Easter Island, and on the epidemics of the insular nations in the Pacific Ocean. As chief medical officer of the Colonial Government of Fiji, and president, for a time, of the Board of Health, Mr. Corney was enabled to superintend and issue reports on the native population, especially as to the question of their threatened extinction, and on his return to England he was made honorary secretary for Polynesia, in the Epidemiological Section of the Royal Society of Medicine. Mr. Corney should be remembered for a highly instructive series of surgical instruments of the most primitive character which he presented a few years ago to the museum of the Royal College of Surgeons of England, which have been arranged and catalogued in the instrument room in that institution. These instruments are no longer to be found in Fiji, as, thanks to Mr. Corney and his associates, natives educated on European lines have replaced the medicine men who gave these strange instruments to the donor, explaining the uses to which they were applied.

We regret to record the death of Dr. James Albert Gibson, M.B.E., of Carisbrooke, on October 12th, at the age of 59. Dr. Gibson was educated at Edinburgh, and at King's College and University College, London. He graduated M.B., C.M.Edin. in 1889, and proceeded M.D. in 1897. In 1906 he obtained the diploma of public health R.C.P.S.I. For the last fifteen years he had been medical officer of health for the rural district of the Isle of Wight and the urban district of East Cowes, and held for some time the appointment of county schools medical officer. He had been medical superintendent of the Joint Isolation Hospital since it was built, and was the county director for the island for the British Red Cross Society. He was chairman of the Isle of Wight Division of the Southern Branch of the British Medical Association, and an ex-secretary and ex-president of the Southern Branch of the Society of Medical Officers of Health. During the war he served as specialist sanitary officer to the Portsmouth garrison from 1914 to 1919, and was honorary medical officer in charge of the Seely Red Cross Hospital from 1914 to 1917. He contributed various articles on public health matters to *Public Health*. He leaves a widow and one daughter. The large attendance at the funeral service included the representative of Princess Beatrice, President of the Isle of Wight Branch of the British Red Cross Society, the Mayor of Newport, and representatives of the British Medical Association, the British Legion, the rural district council, and voluntary aid detachments.

Universities and Colleges.

UNIVERSITY OF OXFORD.

At a congregation held on October 16th the degree of Bachelor of Medicine (B.M.) was conferred on J. W. Alden.

UNIVERSITY OF CAMBRIDGE.

At a congregation held on October 18th the following medical degrees were conferred:

M.D.—H. T. H. Butt, F. B. Hobbs.
M.Ch.—A. E. Roche.
M.B., B.Ch.—B. B. Jareja, P. D. Griffiths, T. A. Butcher.
M.B.—J. C. N. Harris.
B.Ch.—C. J. P. Grosvenor.

UNIVERSITY OF GLASGOW.

The following degrees were conferred on October 20th:

M.D.—(*With Honours*) G. A. Allan. (*With Commendation*) A. Climie. (*Ordinary Degree*) J. A. Doctor, A. H. Hall, W. L. Templeton.

The degrees of M.B., B.Ch. were conferred upon the 152 successful candidates whose names were published in our last issue, page 744.

The Brunton Memorial Prize of £10 for the most distinguished graduate in medicine of the year has been awarded to Gavin M'Callum, and Elinor Drinkwater Jackson has gained the West of Scotland R.A.M.C. Memorial Prize awarded to the candidate who obtained the highest aggregate marks in the final examinations held during 1924.

UNIVERSITY OF DUBLIN.

School of Physic, Trinity College.

The following candidates have been approved at the examinations indicated:

Final M.B., Part I.—*Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Pathology and Bacteriology*: *S. F. Heatley, Margaret H. Donaldson, Nancie N. Lowther, S. Smyth, W. P. Culbertson, W. Magowan, J. C. C. Boyle, E. E. Satchwell, H. A. Brittain, R. Kahn, G. A. Walmsley, W. Sinclair, D. Bluett, Mabel E. Brittain, Aileen Fair, Jane D. Fulton, W. R. G. Gallagher, G. V. A. Griffith, E. H. Hall, V. G. Horan, E. E. Malone, H. Nelson, A. E. A. O'Byrne, Frances E. O'Connor, P. F. Palmer, Grace J. Rankin, Stella C. Ross, W. Russell, J. C. T. Sanctuary, L. B. Somerville Large, H. Trant, R. T. P. Tweedy, E. J. Walsh, C. F. M. Wilson.

D.P.H., PART I.—*Chemistry, Bacteriology, Physics, and Meteorology:* K. J. Bhavnani, J. M. Gray, W. T. Hogan. PART II.—*Sanitary Engineering, Practical Sanitary Report, Hygiene and Epidemiology, Vital Statistics and Sanitary Law:* E. Parker, K. J. Bhavnani.

DIPLOMA IN GYNAECOLOGY AND OBSTETRICS.—C. C. Coghlan.

* Passed on high marks.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AFTER the delivery of the Harveian Oration by Sir Archibald Garrod (printed in full at p. 747), the President, Sir Humphry Rolleston, Bt., presented the Weber-Parkes Prize and Medal to Professor Leon Calmette, formerly of Lisle, now Subdirector of the Pasteur Institute, for his researches on tuberculosis. The President referred to him as the foremost authority on this subject, at the same time alluding to his researches into other aspects of bacteriology. He then presented the Moxon Gold Medal to Sir Leonard Rogers, F.R.S., for his distinguished researches in clinical medicine. He mentioned that there were few tropical diseases in regard to which he had not laid us under his debt by his investigation. He mentioned especially dysentery, kala-azar, cholera, and leprosy, and wished him success in his present researches into the treatment of tuberculosis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Annual Meeting of Fellows and Members.

THE annual meeting of Fellows and Members will be held at the College in Lincoln's Inn Fields on Thursday, November 20th, at 3 p.m., when the Council's report will be laid before the meeting. Fellows and Members can obtain copies of the report on application to the Secretary. Motions to be brought forward at the meeting must be signed by the mover and received by the Secretary not later than November 10th.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

AT the meeting of the Royal College of Surgeons of Edinburgh held on October 15th Sir Harold J. Stiles, LL.D., was re-elected President for the ensuing year, Sir David Wallace, C.M.G., D.L., Vice-President, and Mr. Alexander Miles, F.R.C.S.E., Secretary and Treasurer.

Mr. Pirie Watson, F.R.C.S.E., was approved as a Lecturer in Surgery at the Extra-mural School.

The following 23 successful candidates, out of 54 entered, having passed the requisite examinations, have been admitted Fellows:

F. G. Bell, A. P. Bertwistle, E. S. Clayton, A. J. Dodhi, J. A. Douglas, A. M. Elliott, Captain A. S. Fry, I.M.S., C. A. S. P. Jayanayake, L. M. McKillop, I. Maisels, T. McW. Millar, J. Miller, H. MacD. Monro, H. Mortimer, Surgeon Captain J. R. Muir, R.N., S. L. Navaratnam, F. H. B. Norrie, T. G. R. Panikkar, J. W. Riddoch, R. H. Rose-Innes, H. C. Suri, W. P. Tew, D. St.J. Wigle.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

AT the annual meeting of the President and Fellows of the Royal College of Physicians of Ireland, held on St. Luke's Day, October 18th, the following officers were elected: *President:* Sir William J. Thompson. *Vice-President:* Dr. W. A. Winter. *Censors:* Drs. W. A. Winter, Gibbon Fitzgibbon, G. E. Nesbitt, and R. J. Rowlette. *Representative on the General Medical Council:* Sir John Moore.

Mrs. Mary Ellice Thorn Hearn, M.D., and Major J. Drummond Sands, I.M.S., were elected Fellows of the College.

CONJOINT BOARD IN SCOTLAND.

THE following candidates have been approved at the examinations indicated:

D.P.H.—G. M. Currie, J. L. Connacher, J. Yule, R. Lockhart, T. M. Hunter, Margaret W. Kemp, Margaret M. U. Martin, R. Armstrong, A. Hamilton, A. King, Mary N. Hendry, Alice McGlashan, Annabella McGarrity, T. S. McKean, Anne M. Forrest, May Marshall, J. D. Dear, A. Penman, Annie G. Learmonth, Elizabeth M. Lindsay, P. V. Pritchard, I. M. D. Grieve, F. B. Mackenzie, Jenny C. King, Winifred Wight, Isobel C. Macdonald, Elizabeth McV. J. Currie, R. J. Matthews, Sheila Hunter, A. M. M. Grierson, F. W. Gavin, G. W. Simpson, Phyllis M. H. Lunn, G. S. K. Iyer, Jean V. Kirkwood, R. H. Dunlop, Margaret D. Cairns, Catherine McL. Buchanan, W. H. Carter, Christina Grant, Daisy B. McBride, C. C. I. Slorach, Isabella P. Crosbie, J. C. Macartney. *Part I:* M. J. Bett, Marjorie H. Mitchell, I. M. Burdon, G. J. Bastible, A. H. Campbell, Annie V. Taylor, P. L. McKinlay. *Part II:* Mary M. Jack, W. A. Horne, Violet Oswald.

FINAL EXAMINATION.—*Medicine:* E. A. M. McKinney, D. Isaacs, H. D. J. Lazarus, P. J. Badenhorst, A. M. Filer, W. A. D. Oliver. *Surgery:* J. F. Hedley, J. M. Rutherford, R. W. C. Thambiah, E. G. Douglas, P. J. Badenhorst. *Midwifery:* J. F. Hedley, M. Youakim, A. Vasudev, Florence M. Smith, Irma E. L. Mackenzie, I. Chesarkie, Marian E. Owen-Morris, R. W. C. Thambiah, E. G. Douglas, J. P. T. Mills, A. M. Filer, N. T. Yusif, J. Horsham, W. M. B. Rossie, H. A. Newton, W. A. D. Oliver. *Medical Jurisprudence:* P. L. Low, D. Ross, C. E. Millen, A. Vasudev, J. L. Malone, A. Wilson, F. D. R. Wylie, K. B. Bali, J. L. Clark, G. J. Bell, H. B. Warner, H. J. Marcelin, J. Sullivan, A. G. Farquharson, P. King, J. W. McVicker, Mary A. McGill, J. K. Steel, G. M. Johnson, A. B. C. Doray, W. Allan, J. E. Kennedy.

The following, having passed the Final Examination, were admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P.and S.G.:

N. Ampalavanar, E. S. Brohier, C. J. B. Cave, T. Y. Chia, F. El-Ahmadi, A. S. P. Fernando, E. C. Gilles, P. Groarke, R. H. Holt, T. Hughes, J. K. Hunter, H. R. James, B. S. Jayawardene, J. W. Keighley, T. F. Kelly, C. McCulloch, L. MacLean, R. N. Martin, D. S. Middleton, T. J. Muir, M. Perera, K. Poothatamby, F. P. Rust, W. Rutherford, D. Stewart, J. P. Subramamiam, G. H. Tarras, V. B. van Dort, W. G. S. Pepper, V. P. Thiyagaraja, J. A. McCann.

Medico-Legal.

R. *v.* HADWEN.

A RULE NISI was granted by the Lord Chief Justice, and Avory and Salter, JJ., in the King's Bench Division of the High Court of Justice, sitting on October 17th, calling on Dr. W. R. Hadwen of Gloucester (who, on October 2nd, was committed for trial to the Gloucester City Assizes on a charge of manslaughter) to show cause why the trial of his case should not be removed to the Old Bailey. Dr. Hadwen was also committed for trial on a coroner's indictment.

The court was moved by Mr. St. John Micklethwait, at the instance of the Director of Public Prosecutions, who said that the ground of the application was that it was not possible to obtain a fair trial in Gloucester, and, in support of this statement, he read an affidavit by the Deputy Chief Constable for Gloucestershire, which said that at an inquest on Nellie Christabel Burnham, on September 12th, the coroner's jury returned a verdict of manslaughter against Dr. Hadwen—it was believed by a majority of nine to three. The foreman, after the verdict was given, was alleged to have said to Dr. Hadwen: "I am sorry; of course, you know I did not agree." Dr. Hadwen was well known in Gloucester as a medical man, and also as a public man. The people of Gloucester were taking great interest in the case, and as many as 200 people assembled at the entrance to the police court and showed considerable feeling, Dr. Hadwen being cheered, and the crowd singing "For he's a jolly good fellow." The crowd showed hostility to the witnesses for the prosecution, including Dr. Ellis, and all this had been reported in the public press. During the small-pox epidemic in Gloucester the inhabitants of Gloucester were practically divided into two camps. The present prosecution had revived the old controversy, and was the subject of constant conversation and the exhibition of partisanship among the citizens. As the grand and petty jurors for the coming City Assize would be drawn exclusively from Gloucester City, the deponent was of opinion that a fair and impartial trial could not at present be held in Gloucester.

Sir E. Marshall-Hall, K.C., on October 22nd showed cause, and pointed out that he only knew of two cases reported in which the prosecution had asked for the removal of a case from assize to the Central Criminal Court, and only in one of those cases was the rule made absolute.

The rule was discharged.

The Services.

NAVAL MEDICAL COMPASSIONATE FUND.

AT the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on October 7th, Surgeon Vice-Admiral Joseph Chambers, C.B., C.M.G., R.N., Medical Director-General of the Navy, in the chair, the sum of £69 was distributed among the several applicants.

Medical News.

THE Semon Lecture, which is given under the auspices of the University of London, will be delivered this year by Dr. Guisez of Paris, at the house of the Royal Society of Medicine, 1, Wimpole Street, W., at 3 p.m., on Thursday, November 6th, and not at 5 p.m., as previously stated. The subject of the lecture will be malignant disease of the oesophagus.

A NEW course of post-graduate lectures arranged by the Faculty of Medicine of the University of Sheffield commences on Tuesday next, October 28th, at 3.30 p.m., and will be continued on subsequent Tuesdays and Fridays up till December 19th. A course of six lectures on the history of medicine, by Mr. George Wilkinson, F.R.C.S., will be given in the University during the winter session; the first, on Friday, October 31st, at 4 p.m., is entitled "The Mediaeval Practitioner—Chaucer's 'Doctour of Physik.'"

THE fifth and sixth lectures of the series of post-graduate lectures on cancer will be delivered at 1, Wimpole Street, at 5.30 p.m., on October 29th, by Mr. Sampson Handley, on cancer of the breast, and on October 31st, by Mr. R. H. Jocelyn Swan, on malignant growths of the kidney. On October 27th, at the Hampstead General Hospital, two weeks' intensive course commences, including clinics, operations, and demonstrations in the mornings and afternoons, and lectures at 4 p.m. A combined course in diseases of children has been arranged, from October 27th to November 15th, by the Paddington Green Children's Hospital, the Victoria Hospital, and the Children's Clinic. A course in venereal disease will be held at the London Lock Hospital, Dean Street, from November 3rd to 29th. From November 3rd to 28th a course in dermatology will be held at St. John's Hospital for Diseases of the Skin. A fortnight's course in proctology has been arranged at St. Mark's Hospital from November 10th to 22nd. Syllabuses of the courses may be obtained from the Secretary of the Fellowship of Medicine at 1, Wimpole Street, W.1.

DR. ROBERT BRIDGES, the Poet Laureate, attained his eightieth birthday on Thursday, October 23rd. Dr. Bridges graduated M.B. at Oxford in 1874, and was elected a Fellow of the Royal College of Physicians in 1900. All members of the medical profession will wish to associate themselves with the congratulations and good wishes conveyed to him by his friends and admirers.

THE annual dinner of Fellows and members of sections of the Royal Society of Medicine will be held on Wednesday, November 26th, at 8 p.m., at the Hotel Victoria, Northumberland Avenue, London, S.W.

A SERIES of eight lectures organized by the People's League of Health is being delivered at 11, Chandos Street, Cavendish Square, on "The mind and what we ought to know about it," on Mondays, at 6 p.m. Tickets for the series may be obtained from the office of the League, 12, Stratford Place, W.1.

THE fifteenth international post-graduate course at Vienna will be held from November 24th to December 6th, and will deal with children's diseases. The subjects to be treated include tuberculosis, various nervous diseases, exanthemata and erythemata, diabetes, and orthopaedics. During the last three days there will be the usual class work. Medical practitioners wishing to attend should communicate in writing with the secretary of the course, Dr. Kronfeld, Porzellangasse 22, Vienna IX; the fee is 500,000 kronen. The sixteenth international course will be held from February 9th to 21st, 1925, and will deal with diseases of the digestive organs. A detailed programme will be issued shortly.

THE annual dinner of the Cambridge Graduates' Club of St. Bartholomew's Hospital will be held on Wednesday, November 19th, at 7.30 p.m., in the Grand Hall of the Hotel Victoria, with Dr. J. H. Drysdale in the chair.

THE University of Bristol Association of Alumni (London branch) will hold its annual dinner on Friday, November 7th, at 7.45 p.m., at Pagani's Restaurant, Great Portland Street. Viscount Haldane will preside. Members of the University and past members of its associated colleges are invited to apply for tickets (price 8s. 6d., exclusive of wines) to the honorary secretary, Dr. Elizabeth Casson, Holloway Sanatorium, Virginia Water.

THE Aberdeen University Club, London, will hold its biannual dinner (which on this occasion celebrates the George MacDonald Centenary) on Thursday, November 6th, at 7.30 p.m., at Gatti's Restaurant, Strand. Dr. Milligan, 11, Upper Brook Street, W.1, will be pleased to hear from graduates, past or present, wishing to attend or to join the club.

THE extensions to the Alton Cottage Hospital provided by the generosity of Mr. and Mrs. F. B. Summers of Froyle, Hants, in memory of their two children, at a cost of £18,000, were formally opened on October 18th by Canon Causton in the absence of Major-General the Right Hon. J. E. B. Seely. The additions provide for sixteen extra beds, quarters for the medical and nursing staffs, operating theatre, two private wards, a separate block for *x*-ray treatment, and an outpatients' department. A power house has been installed for lighting and heating purposes, and rubber flooring has been laid throughout. The hospital was founded by Canon Causton's father.

IN succession to the late Mr. A. H. Trevor, the Hon. Herbert Crawshay Bailey, Barrister-at-Law, has been appointed as Commissioner of the Board of Control.

THE National Social Hygiene Conference for 1924 will be held in Cincinnati from November 19th to 22nd. This conference marks the tenth anniversary of the founding of the American Social Hygiene Association, and it will be held under the joint auspices of that association and the Cincinnati Social Hygiene Society.

THE Minister of Health is about to make Regulations for the purpose of preventing infection from the employment in and about farms, dairies, etc., of persons suffering from pulmonary tuberculosis. Copies of the draft Regulations which have been prepared for this purpose can be purchased under the description "Draft dated 17th October, 1924, of the Public Health (Prevention of Tuberculosis) Regulations, 1924," from H.M. Stationery Office, Adastral House, Kingsway, W.C.2, either directly or through any bookseller (price 1d.). Any representations on the subject should be addressed to the Secretary to the Ministry at an early date.

MR. V. WARREN LOW, C.B., F.R.C.S., was the guest of the Surgical Instrument Manufacturers' Association at the annual dinner, at the Holborn Restaurant, on October 10th. In acknowledging the toast of the guests, he complimented British manufacturers upon the very high standard of excellence reached by them in the surgical instuments they produced. He considered that British manufacturers had not only kept abreast of the times, but had presented to the world types, characteristics, and qualities which defied imitation.

THE issue of the *Paris Médical* dated October 4th is devoted to neurology, and contains the annual review of this subject for 1924 by J. Camus. Other articles in this issue deal with the modern treatment of meningitis, writer's cramp, and the differential diagnosis of medullary compression and sclerosis.

MORE than fifty medical practitioners from eleven European countries took part in a tour of the principal Italian spas, organized by the Italian State Tourist Office, between September 18th and October 3rd. Ten different spas were visited in a special first-class train, and the various points of general and clinical interest were demonstrated by the resident medical specialists. Receptions and entertainments were arranged in Milan, Rome, and Naples. A second tour will be organized next year to include some of the more important Italian climatic stations in addition to the spas. Further information may be obtained from the London office of the Italian State Railways and Tourist Department, 12, Waterloo Place, S.W.

THE final report of the Departmental Committee on the use of preservatives and colouring matters in food has been published as we go to press. The Committee was appointed in July, 1923, by the Minister of Health, and its interim report on formaldehyde in meat was reviewed in our issue of August 16th, 1924 (p. 289). The final report (which will be noticed in some detail in an early issue) recommends that with two exceptions preservatives, in the sense defined by the Committee, should be prohibited in all articles of food and drink offered or exposed for sale, whether manufactured in this country or imported. The exceptions are: (1) *Sulphur dioxide* in sausages (up to 3 grains per pound), in jam (up to 0.3 grain per pound), in dried fruit (up to 7 grains per pound), in preserved whole fruit or fruit pulp (up to 5 grains per pound), in beer and cider (up to 5 grains per gallon), in alcoholic and non-alcoholic wines, cordials, and fruit juices (up to 3 grains per pint); and (2) *Benzoic acid* in coffee extracts (up to 3 grains per pound); in non-alcoholic wines, cordials, and fruit juices, as an alternative to sulphur dioxide (up to 5 grains per pint); in sweetened mineral waters and brewed ginger beer (up to 1 grain per pint). The Committee recommends that the use of preservatives, so far as they are permitted, should be conditional on the nature and quantity present in the article of food being declared in a manner prescribed by the Minister of Health. It recommends also that the employment of copper sulphate to colour or preserve the colour of peas and other vegetables should be prohibited, and that the Minister of Health should issue a schedule of colouring matters whose use is non-injurious to health.

Letters, Notes, and Answers.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—not necessarily for publication.

THE telephone number of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is Gerrard 2630 (Internal Exchange). The telegraphic addresses are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London.*

MEDICAL SECRETARY, *Mediocra Westrand, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone: 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

Book Debts.

"R. G. C." bought a death vacancy, but not the book debts, as from May 1st, 1922. How should the first year's profits be calculated as regards gross receipts?

*** Strictly the gross receipts should be the total of the *value* of fees chargeable for work done in the year to April 30th, 1923, whether actually received or not. It is obvious that this amount is difficult to calculate, as it involves detailed estimates for probable bad debts, and consequently some adaptation of the "cash receipts" total is being sought for to serve the purpose. If "R. G. C." had taken over the debts the matter would have been simplified, as he could have included with the receipts for work done by him those for past years; but as he did not take

the debts over he has not the requisite information. The inspector of taxes therefore suggests that to the cash receipts should be added the amount of the book debts owing to "R. G. C." at April 30th, 1923. This is correct, provided that that amount be reduced by a proper allowance for bad debts, but unfortunately "R. G. C.'s" statement does not show how much was owing to him at that date, as his accounts were sent out at the end of March. It is not clear whether the total amount of bills issued at that date is ascertainable; if it is, the solution should be fairly simple—for example, an eleven months' account to that date could be struck, or the account taken to April 30th on the basis of including the April cash receipts and taking the outstandings at the end of that month as the March debts less cash received and less estimated bad debts for the eleven months. An objection the inspector might raise to this is that it includes nothing for work done in April, 1923, unless paid for, seeing that accounts would not have been sent out by "R. G. C." for that month. The inspector suggests that the outstandings at April 30th, 1923, be taken at one-fourth of the 1923-24 bookings (calculated as being receipts *plus* £80 bad debts) *plus* an estimate (three-fourths of £80) for applications for debts surviving from quarter to quarter, *less* the amount of the April, 1923, cash receipts. It will be unfortunate if "R. G. C." has not retained a note of the total of the March, 1923, accounts, as an eleven months' account is a solution preferable to estimating outstanding debts at April 30th, 1923, and then taking eleven-twelfths of the profit so calculated; but if he has not retained that record we advise acceptance of the method proposed by the inspector, though our correspondent may be in a position to show that the practice improved in 1923-24, so that the cash receipts for that year give an indication of the previous year's outstandings, which is excessive, and should be modified for the purpose to which he proposes to put that figure.

Earnings from Previous Employment.

"X. Y. Z." qualified in July, 1922, and had sundry earnings in 1922-23 and 1923-24; in May, 1924, he accepted a post at £360 per annum and has been assessed to income tax at £360. Can he average his earnings?

*** "X. Y. Z." is assessable in respect of his present office or employment and, though the matter is not entirely free from doubt, in our opinion he is not entitled to bring into the average the earnings from previous employment. Such a claim would be particularly difficult to maintain where the employment had been discontinuous, in which case the earnings of parts of a previous year would not produce "a fair and just" average for a year of continuous employment. One point on the actual facts occurs to us; if "Y. Y. Z.'s" engagement dates from, say May 5th, 1924, then in respect of the year to April 5th, 1924, he is assessable in the sum of eleven-twelfths of £360=£330 only so far as this employment is concerned.

"H. C." entered a practice as a junior partner drawing a fourth share of the profits, and inquires what his position is with regard to the deduction of his expenses incurred subsequently.

*** For the period of the assistantship "H. C." was chargeable in respect of his salary, and the amount of the salary was deductible as a business expense in computing the profits of the practice. Subsequently his fourth share (which in a sense displaces the salary) cannot, but his expenses can, be deducted in computing the practice profits. Having arrived at these profits accordingly the three years' average is struck, and "H. C." is liable for his share of the assessment so calculated, and further expenses cannot be deducted therefrom. In other words, the expenses should be those incurred in the separate three years in the carrying on of the practice, not those of the year of assessment. Having regard to the deductibility of the assistantship salary this is not likely to work out unfairly so far as "H. C." and his partner are concerned.

LETTERS, NOTES, ETC.

Herpes Zoster and Varicella.

Dr. W. N. W. Kennedy (Hale, Cheshire) writes: Early last month a married lady, aged 35, consulted me regarding an eruptive condition of her skin. In the interscapular space, slightly to the left of the middle line, there was a herpetiform rash, covering an area roughly equal to that of a half-crown piece. The pustules tended to become confluent, although their original discrete character could still be recognized. There was also some suggestion of haemorrhage. The condition was unassociated with pain, however, and there was no history of trauma or irritation. No other portion of the skin surface was affected. In a week the scabs had separated. Exactly fourteen days from that date one of her children (aged 7 years), developed a characteristic chicken-pox eruption without any systemic symptoms. The family lives in an isolated house in the country. The children had not been in contact with any other children, either at school or with visitors. None of the adults, except the mother, gave a history of a recent skin affection. The circumstances suggest something more than mere coincidence.

Mixed Glands in the Treatment of Rheumatic Affections.

Dr. A. Gordon Watson (Bath) writes: In 100 cases of "rheumatic" arthritis in which a combination of the thyroid, pituitary, ovary, and testis were given by the mouth as an adjunct to other treatment, the following results were noted: 70 felt some benefit from the tonic effect, 20 believed that mixed glands were the deciding factor in their marked improvement, and in 10 cases no difference was discernible. The same preparation was used in all these cases, polyglandin (Allen and Hanburys), which contains in each teaspoonful of the elixir, pituitary 1/4 grain, thyroid 1/2 grain, ovary 2½ grains, testis 2½ grains of the fresh glands. Great difference in individual tolerance was noticed—for example, in one patient, aged 79, half teaspoonful doses caused throbbing headache in the temporal region, but three drops thrice a day was highly effective; a fortnight's course (no other treatment being used) enabled this old gentleman to walk three or four times as well as before; his knees became more supple, and he has largely lost the fear of his knees giving way under him. In some cases of rheumatoid arthritis and chronic "muscular rheumatism" this treatment seems to be of use, but my cases are not yet numerous enough to judge from, more especially as I have not used it alone.

X-Ray Examination in Relation to Pulmonary Tuberculosis.

"General Practitioner" writes to emphasize Dr. F. G. Chandler's remarks (October 18th, p. 742) about the danger of placing reliance on physical signs in diagnosing phthisis. Early phthisis, he says, must be diagnosed by symptoms; and just as important as tubercle bacilli, toxaemia, and evening rise of temperature, is a weekly record of the patient's weight. Examination of many thousands of specimens of sputum has also impressed me with the fact that failure to find the bacillus must not negative the diagnosis. Many years ago, I well remember the late Dr. Schorstein saying, "When you can diagnose phthisis by physical signs, you can do nothing for your patient." The early symptom of maliguant disease of the larynx—huskiness or loss of voice—is frequently neglected until the patient is past help. . . . At present no help or encouragement is offered to men wishing to do post-graduate work; it has to be done in their leisure hours and at their own expense; also, for obvious reasons, resident posts in special hospitals are frequently given to men from the Dominions.

Free Passages for University Graduates.

Dr. Alex Hill (secretary of the Universities Bureau of the British Empire) informs us that the six great lines engaged in the passenger service to Australia and New Zealand have agreed to grant eight free first-class return tickets yearly to university graduates desirous of studying problems connected with the development of the resources of the Dominions or of holding temporary teaching posts. The selection of the recipients is to rest with a committee of the Universities Bureau, 50, Russell Square, London, W.C.1.

Telephones for Motorists.

During the past month the Automobile Association has installed eight more day-and-night roadside telephones for the use of its members. The "A.A." roadside telephones are distributed throughout the country along the main roads, and access is given to the telephones by a special key issued to members. The new telephones are located at the cross roads at Pulham, on the main Norwich-Ipswich road; at Flint House cross roads, on the Newmarket-Royston and Ware-Cambridge roads; at Blackmoor Gate, on the Lynton-Barnstaple and Ilfracombe-Wheddon cross roads; at Halcon Corner, on the Taunton-Ilminster road; at Desford cross roads on the Leicester-Hinckley road; at New Moot House cross roads, on the Morpeth-Wooler-Alnwick-Rothbury roads; at Cadnam cross roads, on the Southampton-Lyndhurst road; and at East Horndon, on the new Southend road.

Discussion on Cardiac Irregularities.

Correction.

By an oversight it was stated last week that Dr. Langdon Brown was in the chair of the Section of Medicine of the Annual Meeting at Bradford when Professor Wardrop Griffith opened the discussion on cardiac irregularities. The chair was taken on this occasion by the president of the section, Professor Arthur J. Hall, of Sheffield.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 38, 40, 41, 44, and 45 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 42, 43, and 44.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *159*.